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BEEF AND DAIRY EQUIPMENT Plans

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COOPERATIVE EXTENSION SERVICE
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BEEF & DAIRY EQUIPMENT PLANS

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WITHDRAWN 263078

FEED LOT REQUIREMENTS

BEEF

FEED LOT AREAS

Good drainage unsurfaced - 200 to 300 sq. ft. per animal.
Average drainage unsurfaced - 300 to 400 sq. ft. per animal.
Concreted - 50 to 70 sq. ft. per animal.
Slope concreted lots 2 to 4 ft. per 100 (1/4 to 1/2 in. per ft.) away from farmstead and to adequate drainage way.

ALLEYS

For vehicles, 12 ft. wide minimum.
Main alleys, heavy traffic, 16 ft.
All-weather surface (concrete or heavy gravel)

FENCES - All permanent and alley fences, 5 to 5 1/2 ft. high.

FEED SPACE

Self-feeding grain only, 3 to 4 in. feeder per head.
Self-feeding silo, or free access hay and silage, 4 to 6 in. manger per head.
Not self-fed (hay, silage, grain) 20 to 24 in. per animal.

AUTOMATIC HEATED WATERER - Approx. 80 head per ft. of trough.

SHADE

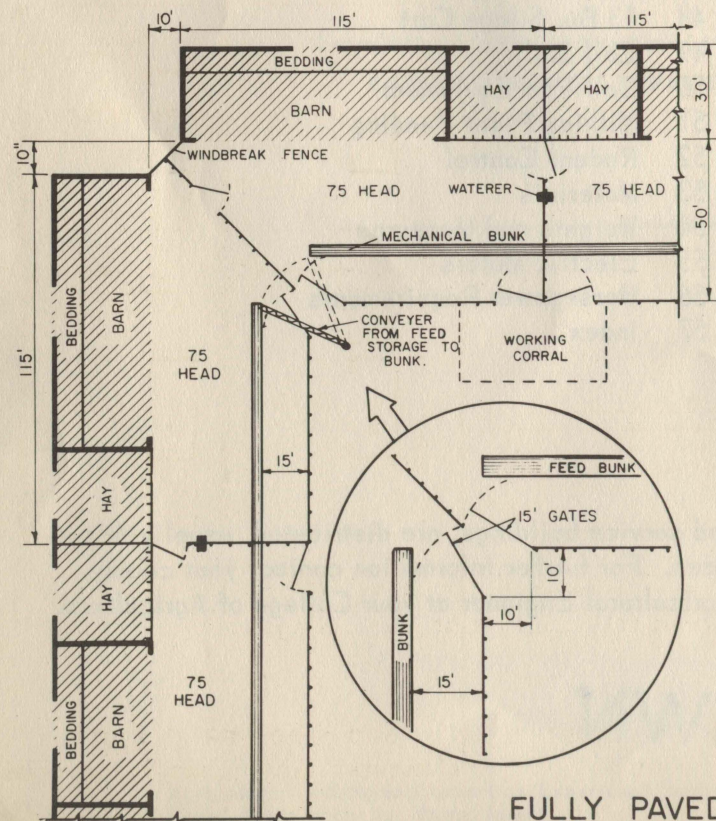
30 to 40 sq. ft. per head, 10 to 12 ft. high.
North-south orientation of long axis permits sun-drying under shade.

BARN SPACE (ventilate well for summer shade)

Cows 30 to 40 sq. ft. per animal.
Calves and yearlings 15 to 25 sq. ft. per animal.
Feeders (700 and above) 25 to 30 sq. ft. per animal.

FACE OPENINGS AND BUILDINGS AWAY FROM PREVAILING WINDS

NOTE: IF CATTLE ARE ON FULL FEED WITH RESTRICTED ROUGHAGES, SELF-FEEDING HAY STORAGES WILL BE OMITTED. HAY AND/OR SILAGE WILL THEN BE FED FROM "FEED SOURCE".



FULLY PAVED FEED LOTS

DAIRY

LOOSE HOUSING

PAVED ROUGHAGE FEEDING AREA

Keep free of hay, bedding, and litter.
Batch-feeding both hay and silage, 30 in. manger per cow.
Free choice feeding either hay or silage, 12 to 18 in. manger per cow.
Self-feeding bunker silo, 4 to 6 in. per cow.
Automatic waterers, approx. 60 head per ft. of trough in feed lot.
Provide storage for 4 1/2 tons of hay, or equivalent, per cow, for 240-day feeding season. 3 tons of silage are equivalent to 1 ton of hay.

RESTING AREA

40 to 50 sq. ft. per animal in central zones.
60 sq. ft. for larger breeds, and all breeds in northern zones.
Open, or well ventilated barn.
Foundations, walls, and ceiling or roof height planned for 3 to 4 ft. manure pack.
Arrange to eliminate feeding, watering, or cross traffic in resting area.
Well-drained site, floor 6 to 8 in. above grade.
Bedding storage: 1 1/2 to 2 tons per cow.

PAVED HOLDING AREA

15 to 25 sq. ft. per cow.
Cow steps into milking plant: 16 to 24 in. tread up to 8 in. rise.
Ramp out no steeper than 3 in. rise per foot of run.
May be roofed; should be adequately fenced.
In most areas holding in the resting area is not recommended.

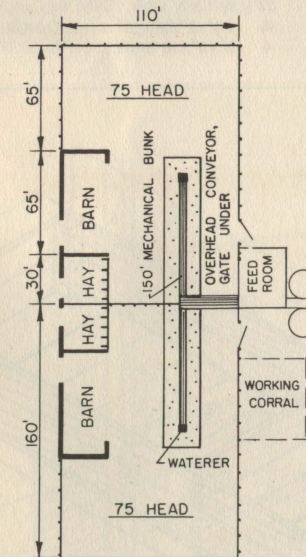
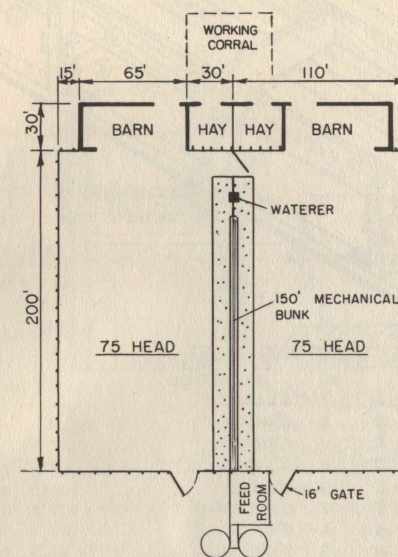
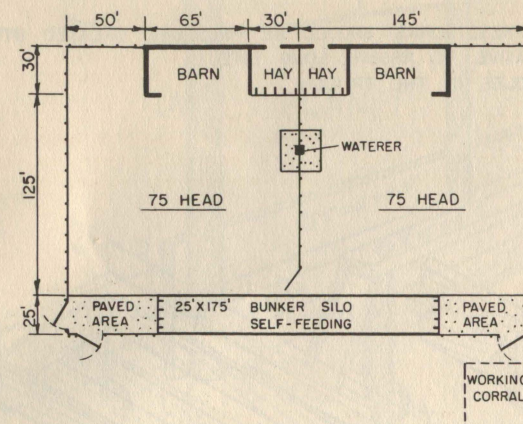
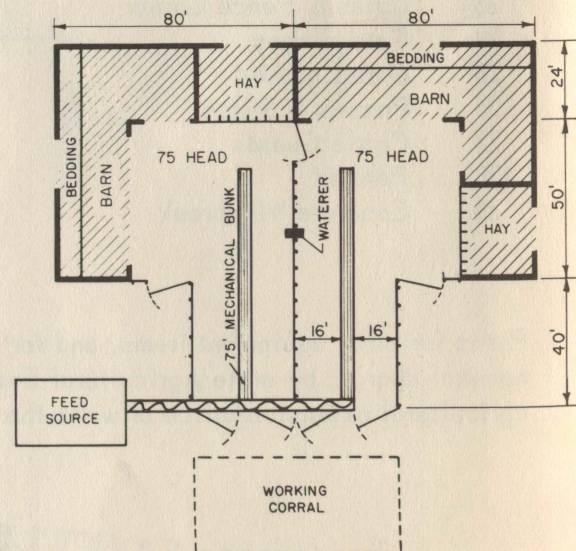
PAVED YARD

100 sq. ft. per cow recommended.
Slope lot 2 to 4 ft. per 100 (1/4 to 1/2 in. per ft.) away from farmstead and to adequate outlet.
An earth or grassed lot with shade, free of mud, in addition to the paved yard will increase cow comfort and decrease cleaning required.

HOSPITAL AND CALF PENS

South exposure, well ventilated and lighted.
Stanchions for blood testing, veterinary service etc. (1 for each 10 cows), or sorting pen with cattle squeeze or restraining chute.
Pen space required per animal:
15 to 20 sq. ft. to 1 1/2 months.
20 to 25 sq. ft. 1 1/2 to 10 months.
30 to 40 sq. ft. over 10 months.
90 to 120 sq. ft. maternity pen.
120 to 160 sq. ft. bull pen.

May be open front, even in northern areas, if:
48 in. high solid partitions that can be raised as manure pack builds up.
Heat lamps available for emergency use.
Frost-proof waterbowls between each pair of pens.
Steel pen equipment set in 12 to 18 in. high concrete curb.
Young stock rotated through pens in fall to develop manure pack.
Pens arranged for tractor cleaning.



150 HEAD PER LAYOUT
10' PAVEMENT ALONG BUNKS AND WATERERS

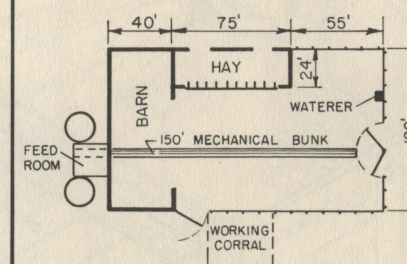
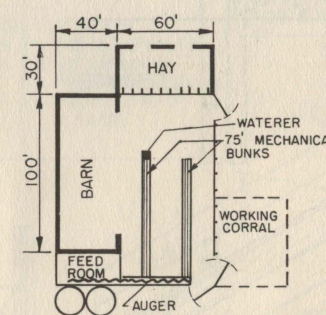
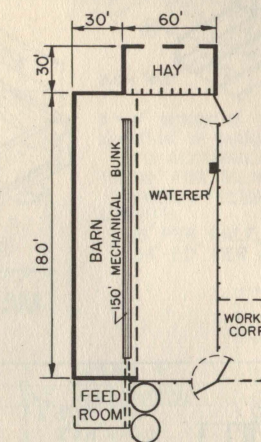
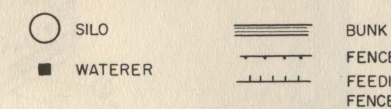
NOTES:

THESE LAYOUTS ARE SHOWN AS EXAMPLES OF THE USE OF THE DATA ON PAGE 2.

SHAPE, LAYOUT, AND DRAINAGE FOR ACTUAL FARM LAYOUT MUST BE BASED ON HERD SIZE, TOTAL MANAGEMENT PROGRAM, TOPOGRAPHY, AND POTENTIAL EXPANSION.

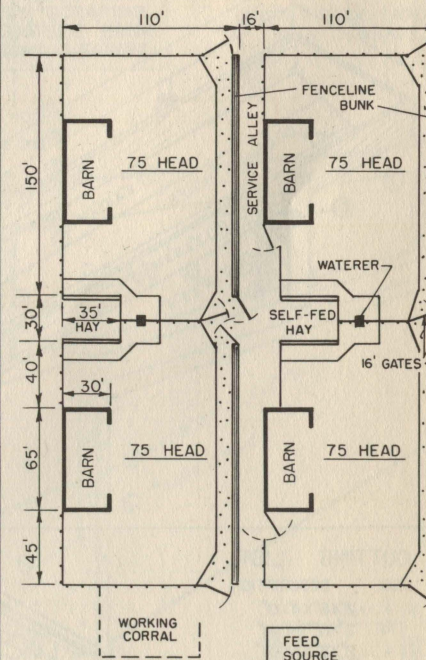
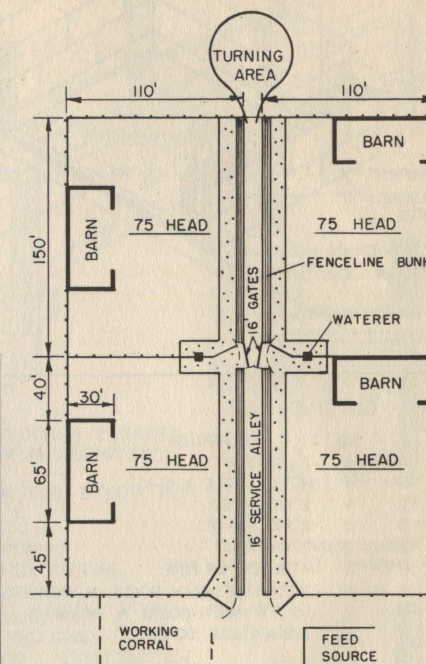
ALL OF THE LAYOUTS ON THIS PAGE ARE TO THE SAME SCALE.

SYMBOLS



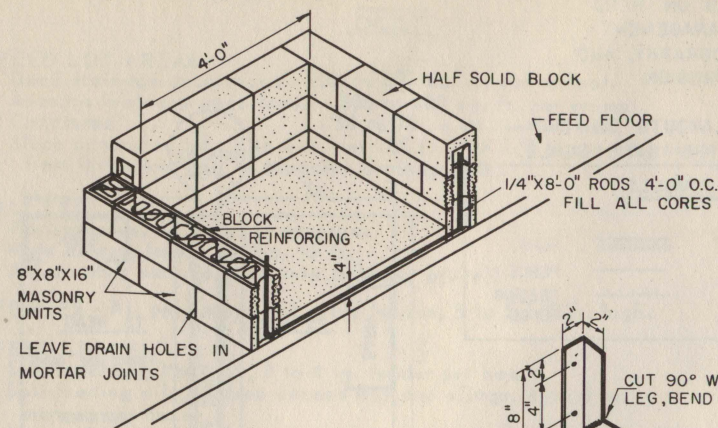
150 HEAD PER LAYOUT
FULLY PAVED

FEED LOT LAYOUTS



300 HEAD PER LAYOUT
10' PAVEMENT ALONG BUNKS AND WATERERS

FEED BUNKS

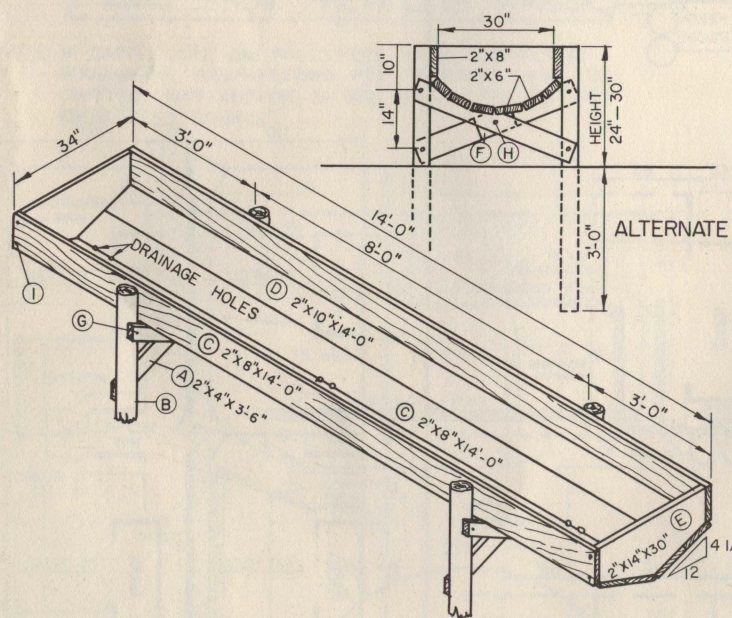


CUTTING LIST

NO.	DESCRIPTION
A	4 2"x4"x3'-6"
B	4 4" TOP POLE X 5'-6"
C	4 2"x8"x14'-0"
D	2 2"x10"x14'-0"
E	2 2"x14"x30"
F	2 4" BLOCK OR PIPE
G	16 1/2"x6 1/2" MACH. BOLTS & WASHERS
H	2 1/2"x8" MACH. BOLTS & WASHERS
I	24 3/8"x4" LAG SCREWS

ALLOW 2' LENGTH OF BUNK FOR EACH COW OR STEER, 1 1/2' FOR CALVES. BUNK HEIGHT SHOULD BE 15"-18" FOR CALVES, 24"-30" FOR COWS OR STEERS. BUNKS BUILT FOR MATURE ANIMALS MAY BE DUG INTO THE GROUND FOR CALVES.

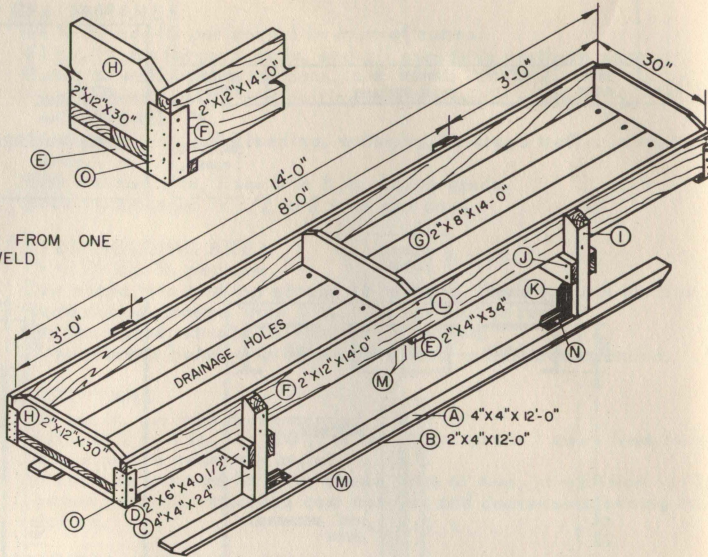
ALL THE LUMBER IN THESE BUNKS SHOULD BE PRESSURE TREATED WITH AN OIL BASE PRESERVATIVE TO ASSURE LONG LIFE. PROVIDE DRAINAGE HOLES IN THE TROUGH.



CUTTING LIST

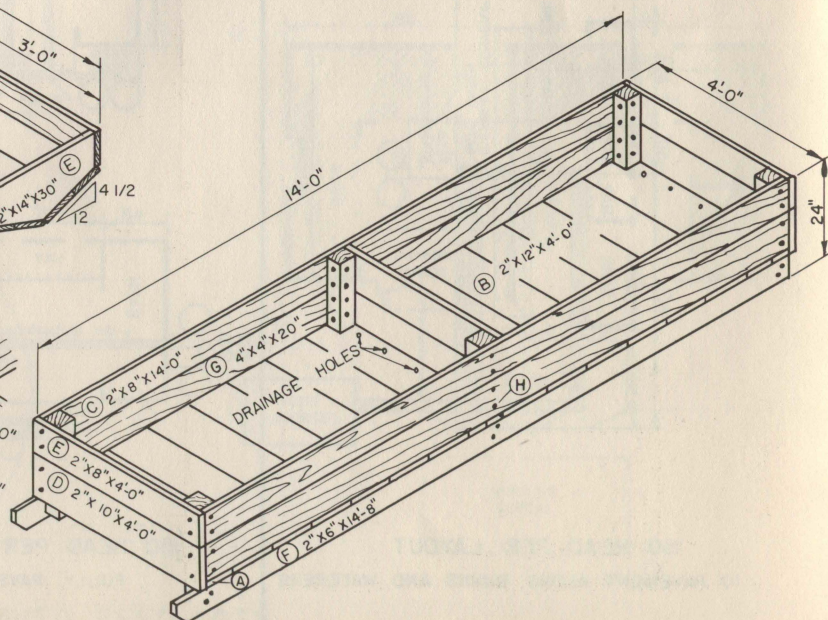
NO.	DESCRIPTION
A	1 2"x8"x4'-0"
B	14 2"x12"x4'-0"
C	4 2"x8"x14'-0"
D	2 2"x10"x4'-0"
E	2 2"x8"x4'-0"
F	2 2"x6"x14'-8"
G	6 4"x4"x20"
H	56 1/2"x6 1/2" MACH. BOLTS & WASHERS

PARTITION POST DETAIL

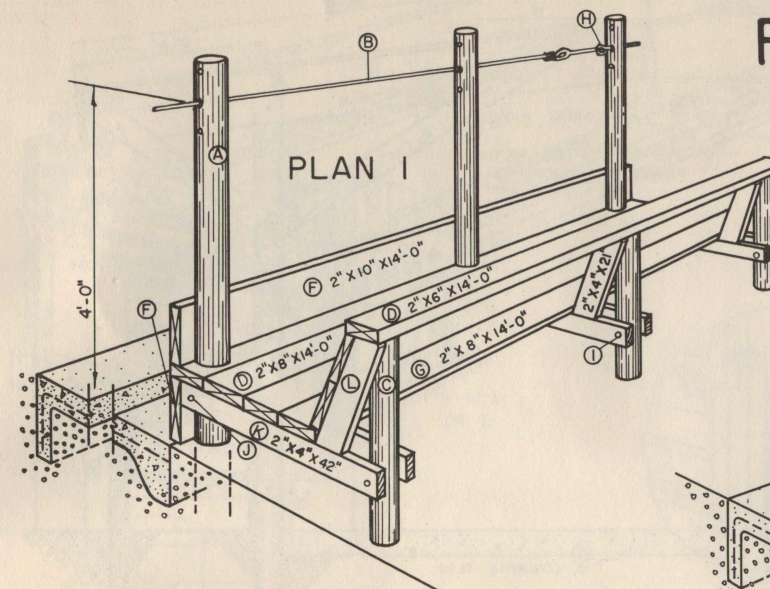


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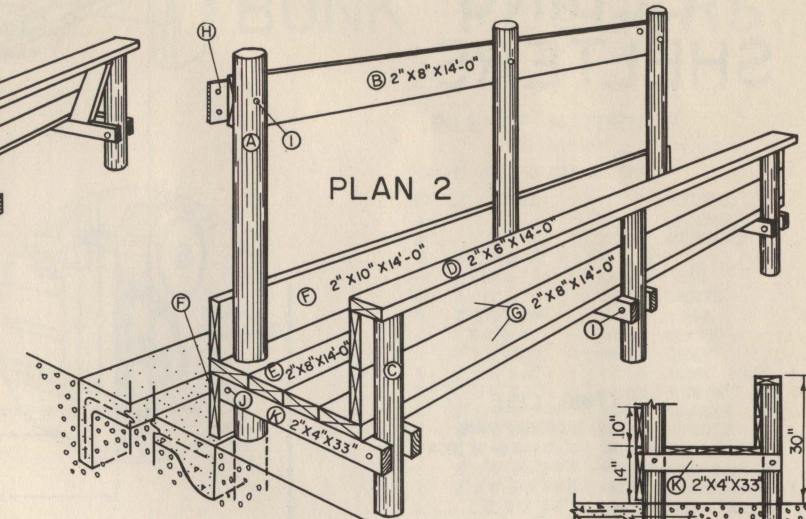
NO.	DESCRIPTION
A	2 4"x4"x12'-0"
B	2 2"x4"x12'-0"
C	4 4"x4"x24"
D	4 2"x6"x40 1/2"
E	3 2"x4"x34"
F	2 2"x12"x14'-0"
G	4 2"x8"x14'-0"
H	3 2"x12"x30"
I	8 1/2"x6" MACH. BOLTS & WASHERS
J	8 1/2"x7 1/2" MACH. BOLTS & WASHERS
K	8 3/8"x4 1/2" MACH. BOLTS & WASHERS
L	18 3/8"x4" LAG SCREWS
M	32 3/8"x3" LAG SCREWS
N	4 1/8"x2"x2"x16" ANGLE IRON
O	4 6"x9"x18 GAGE



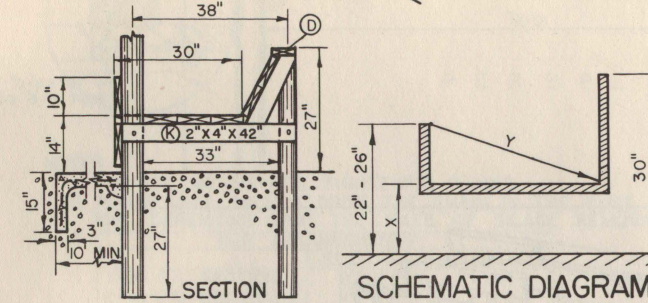
FENCELINE BUNKS



PLAN 1



PLAN 2



SECTION

CUTTING LISTS - 14' LENGTH

PLAN 1	PLAN 2	PLAN 3	PLAN 4
ITEM NO. DESCRIPTION	NO. DESCRIPTION	NO. DESCRIPTION	NO. DESCRIPTION
A 3 5" TOP X 8" POLE	3 5" TOP X 8" POLE	3 4" X 7" CHANNEL	3 3" X 7" PIPE
B 1 CABLE	1 2" X 8" X 14'-0"	1 CABLE	1 2" X 8" X 14'-0"
C 3 4" TOP X 5" POLE	3 4" TOP X 5" POLE	3 3" X 3'-6" PIPE	3 3" X 3'-6" PIPE
D 1 2" X 6" X 14'-0"	1 2" X 6" X 14'-0"	1 2" X 6" X 14'-0"	1 2" X 6" X 14'-0"
E 4 2" X 8" X 14'-0"	4 2" X 8" X 14'-0"	4 2" X 8" X 14'-0"	4 2" X 8" X 14'-0"
F 2 2" X 10" X 14'-0"	2 2" X 10" X 14'-0"	2 2" X 10" X 14'-0"	2 2" X 10" X 14'-0"
G 2 2" X 8" X 14'-0"	2 2" X 8" X 14'-0"	2 2" X 8" X 14'-0"	2 2" X 8" X 14'-0"
H 1 EYE BOLT & SPRING	1 1/4" X 6" X 12" PLATE	1 EYE BOLT & SPRING	1 2" X 6" X 24"
I 3 1/2" X 8" BOLTS	6 1/2" X 8" BOLTS	9 1/2" X 5 1/2" BOLTS	6 1/2" X 5 1/2" BOLTS
J 3 1/2" X 9" BOLTS	3 1/2" X 9" BOLTS	9 1/2" X 6 1/2" BOLTS	2 1/2" X 8" BOLTS
K 6 2" X 4" X 42"	6 2" X 4" X 33"	4 #2(1/4") X 36"	4 #2(1/4") X 7'-0"
L 3 2" X 4" X 21"	2 2" X 4" X 33"	2 #2(1/4") X 14'-0"	4 #2(1/4") X 14'-0"
M CONCRETE, BUNK ONLY	--	1/4 YARDS	2 YARDS

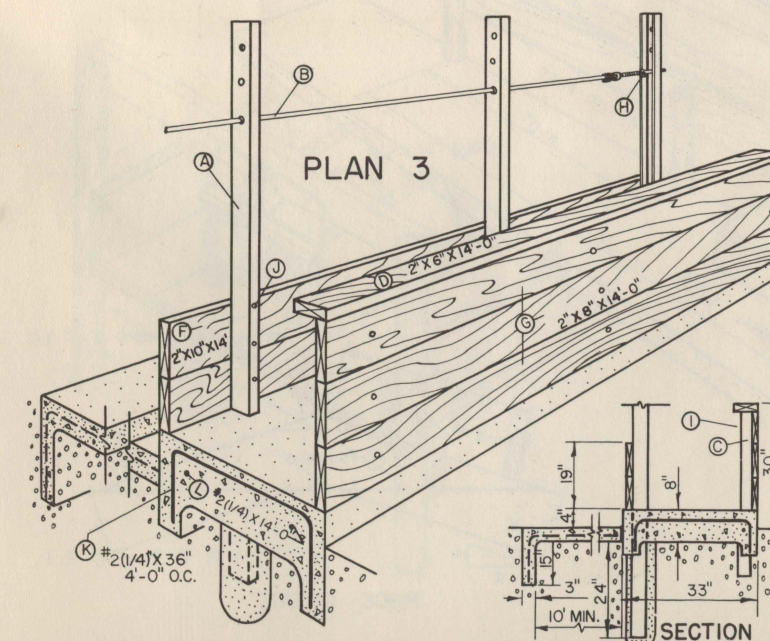
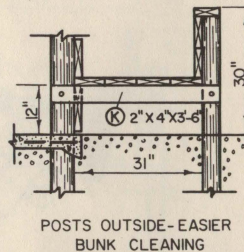
X = 4" MINIMUM IF FEEDING FLOOR IS CLEANED.
X = 12"-14" IF MANURE OR SNOW IS PERMITTED TO ACCUMULATE.
Y = 30" FOR SILAGE OR GRAIN; SEE BELOW FOR GREEN FEEDING.

LENGTH:
18" PER CALF, LIMITED FEEDING.
24"-30" PER ADULT, LIMITED FEEDING.

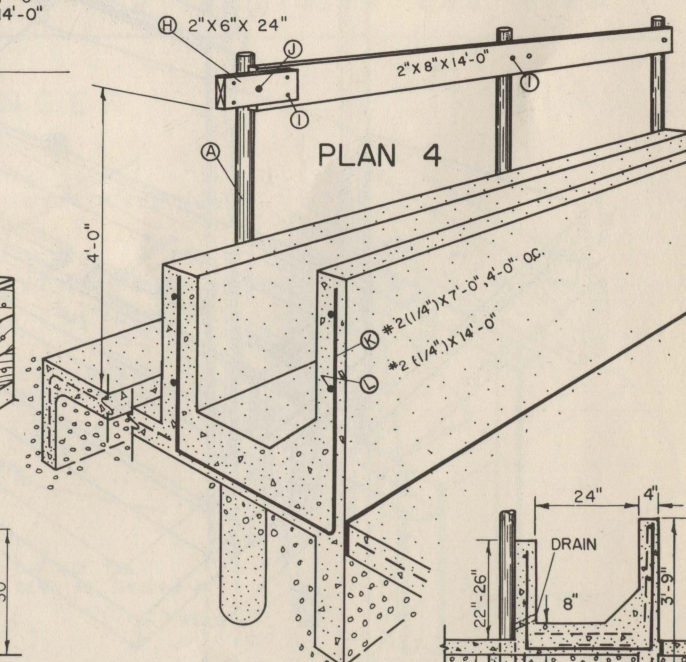
POSTS INSIDE - EASIER LOT SCRAPING

	X	Y
JERSEY	18"	32"
GUERNSEY	19"	34"
HOLSTEIN	20"	36"

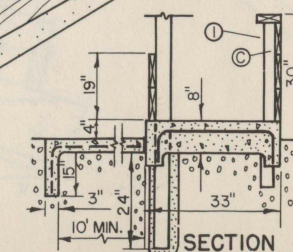
NOTE: POSTS INSIDE BUNK SIMPLIFY LOT SCRAPING. MOVE POSTS OUTSIDE BUNK FOR EASIER BUNK CLEANING.



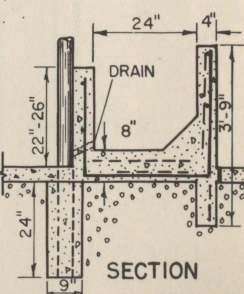
PLAN 3



PLAN 4



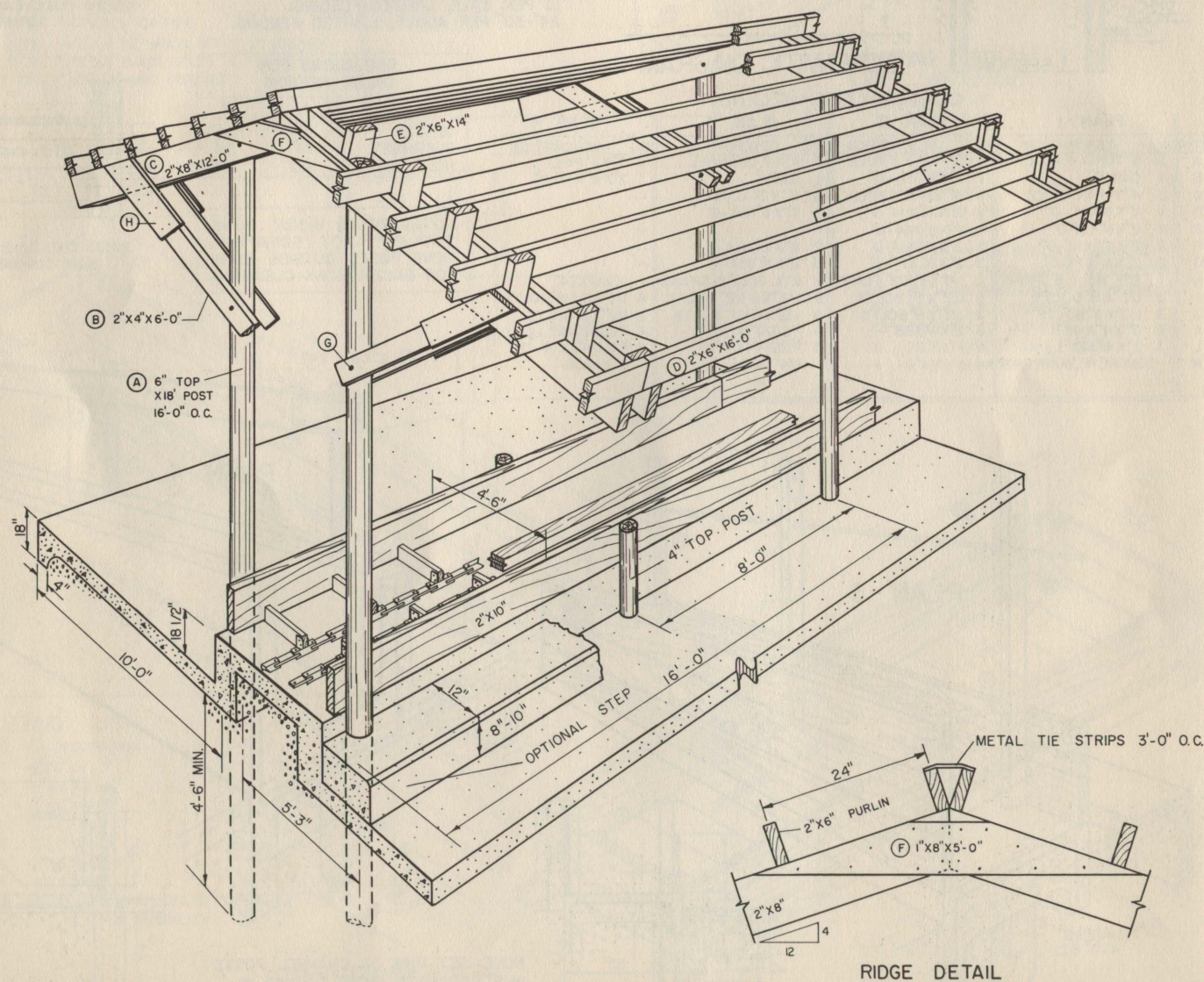
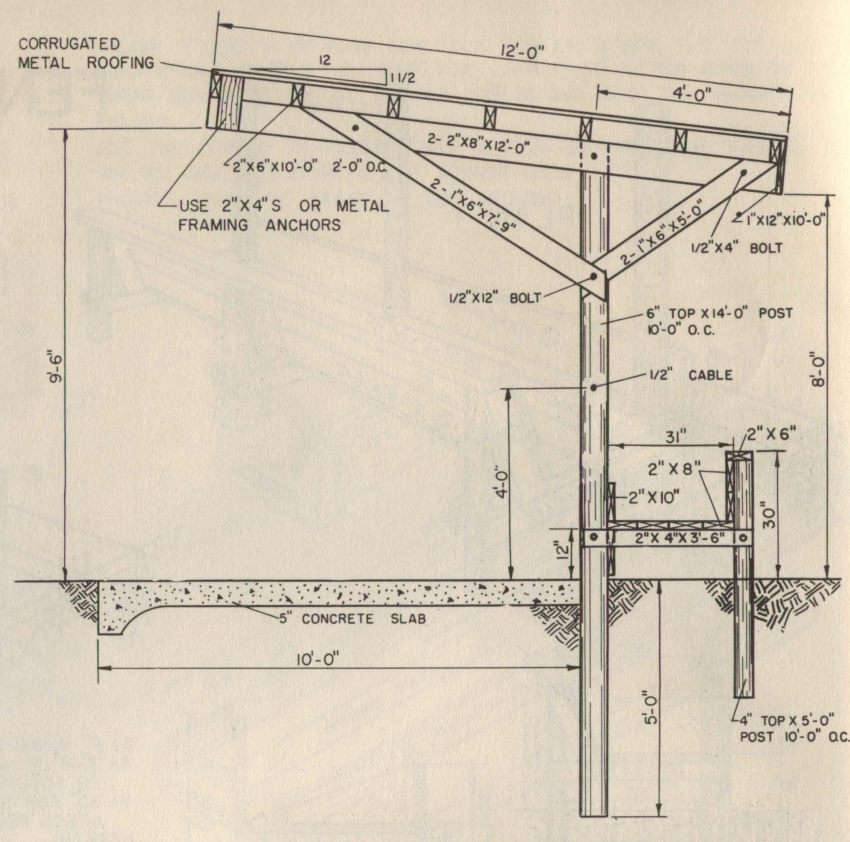
NOTE: SET PIPE OR CHANNEL POSTS IN 9" CONCRETE PIERS POURED IN POST HOLES. CAP TOPS OF PIPE POSTS.



CATTLE FEEDING SHELTERS

CUTTING LIST

ITEM	NO.	DESCRIPTION
A	4	6" TOP X18'-0" POST
B	8	2"X4"X6'-0"
C	8	2"X8"X12'-0"
D	14	2"X6"X16'-0"
E	28	2"X6"X14"
F	4	1"X8"X5'-0"
G	8	1/2"X11" BOLTS
H	8	1"X6"X18"



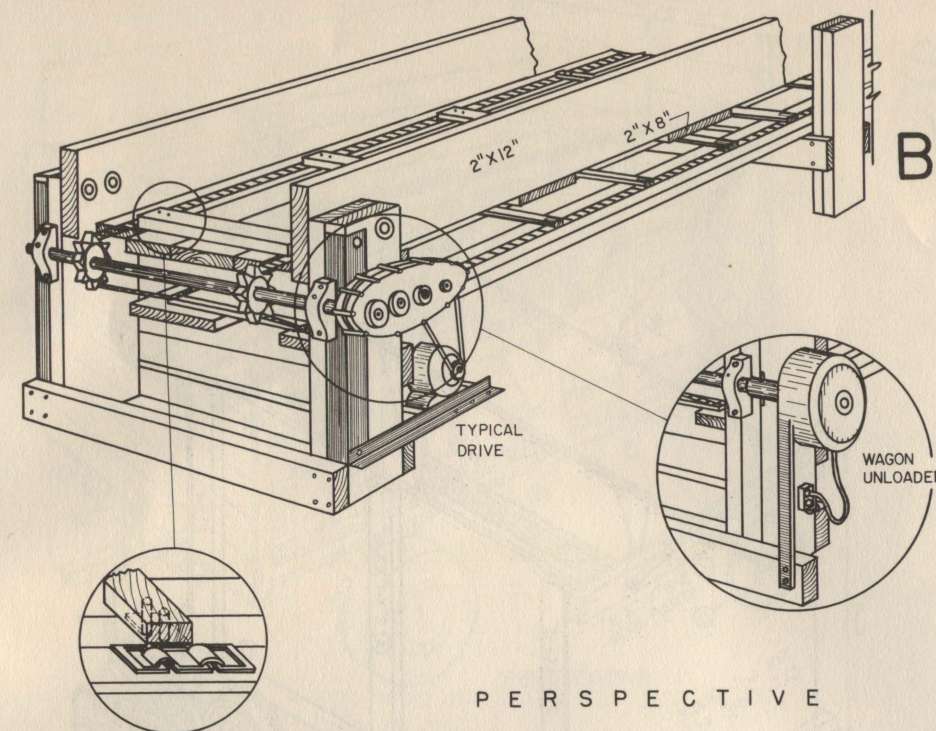
G

MECHANICAL BUNK FEEDERS

BILL OF MATERIALS
10' LENGTH

DRIVE AND IDLER SECTIONS

NO.	SIZE	MATERIAL
1		DRIVE ASSEMBLY
1		IDLER ASSEMBLY
8	1/2" X 6"	BOLTS
142	C - 55	CHAIN LINKS
12	A - 1	ATTACHMENTS
8	2" X 10" X 24"	WOOD LEGS
6	1" X 2" X 27"	WOOD SLATS
2	2" X 12" X 10'	WOOD SIDES
5	2" X 6" X 10'	WOOD BUNK BASE
2	2" X 6" X 10'	WOOD RIDERS
6	2" X 4" X 3'-8"	WOOD BRACES
2	2" X 8" X 37 1/2"	WOOD SUPPORTS
1	2" X 4" X 24"	WOOD COVER SUPPORT
1	2" X 4" X 13"	WOOD COVER SUPPORT
1	2" X 4" X 3'-10"	FRONT GROUND SUPPORT
1		COVER, SHEET METAL
ADDITIONAL 10' SECTION		
2	2" X 12" X 10'	WOOD SIDES
5	2" X 6" X 10'	WOOD BUNK BASE
4	2" X 10" X 24"	WOOD LEGS
2	2" X 4" X 3'-8"	WOOD BRACES
2	2" X 6" X 10'	WOOD RIDERS
2	2" X 8" X 37 1/2"	WOOD SUPPORTS
6	1" X 2" X 27"	WOOD SLATS
4	1/2" X 6"	BOLTS



P E R S P E C T I V E

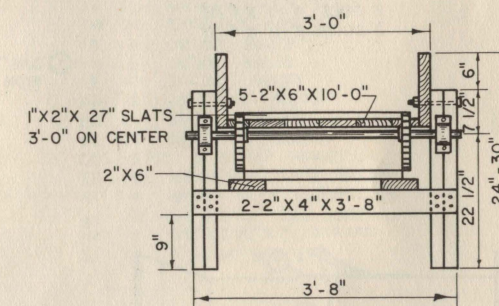
NOTES

- NOTES
1. PROVIDE MEANS FOR TIGHTENING CHAINS.
 2. POWER UNIT SHOULD DRIVE THE CHAIN IN THE BUNK AT 3 TO 7 FEET PER MIN., DEPENDING UPON THE RATE OF SILAGE REMOVAL.

H. P. REQUIREMENTS		
	ELECTRIC	GASOLINE
1-10 FT. SECTION	1/2 H.P.	1 H.P.
2-10 FT. SECTIONS	1/2 H.P.	1 H.P.
3-10 FT. SECTIONS	1 H.P.	1 1/2 H.P.
4-10 FT. SECTIONS	1 H.P.	1 1/2 H.P.
5-10 FT. SECTIONS	2 H.P.	3 H.P.
6-10 FT. SECTIONS	2 H.P.	3 H.P.
7-10 FT. SECTIONS	3 H.P.	5 H.P.
8-10 FT. SECTIONS	3 H.P.	5 H.P.

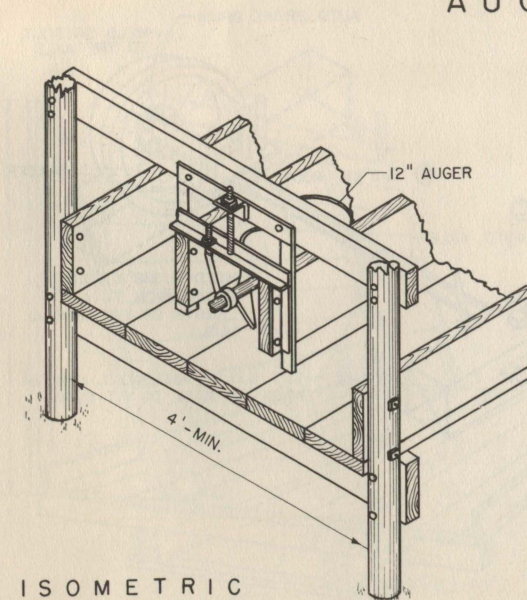
4. MAXIMUM BUNK LENGTH RECOMMENDED FOR NO. 55 CHAIN: 80'.
5. POWER UNIT FROM A SELF-UNLOADING WAGON CAN BE USED FOR POWER.
6. USE WEATHERPROOF ELECTRICAL EQUIPMENT.

CHAIN FEEDER

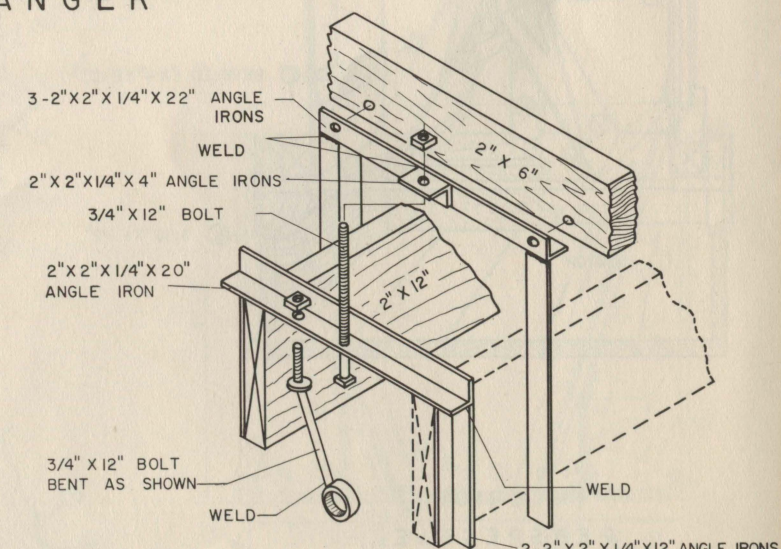


IDLER END VIEW

AUGER HANGER



ISOMETRIC



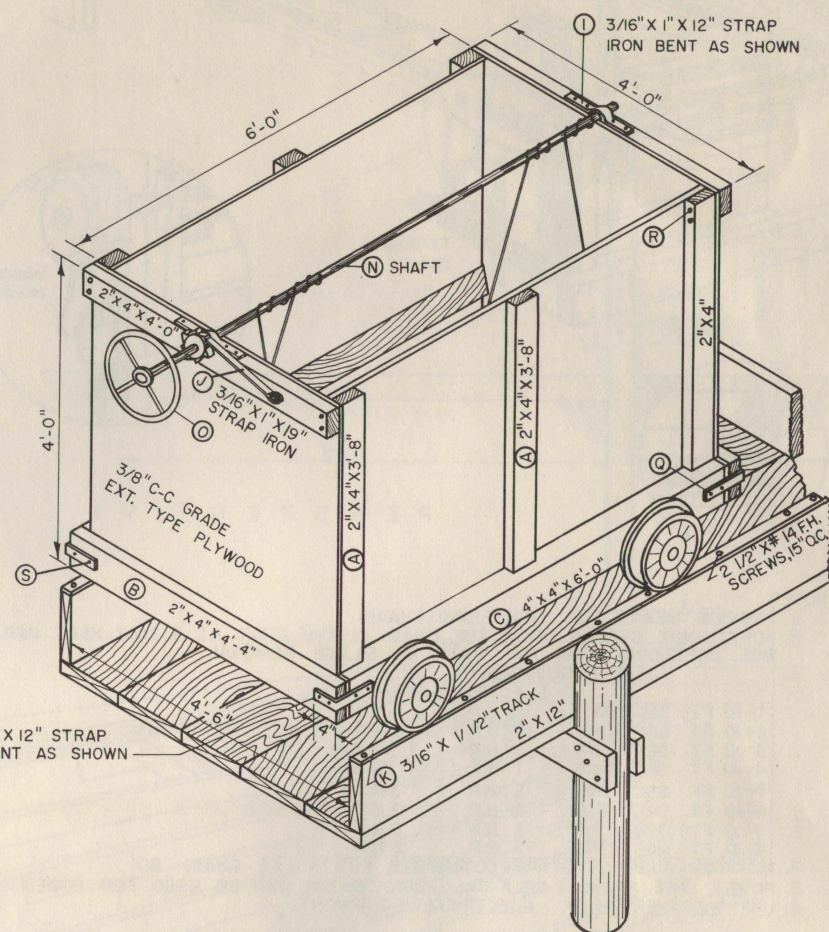
AUGER SUPPORT DETAIL

CATTLE BUNK FEED CART

43 BUSHEL CAPACITY

CUTTING LIST

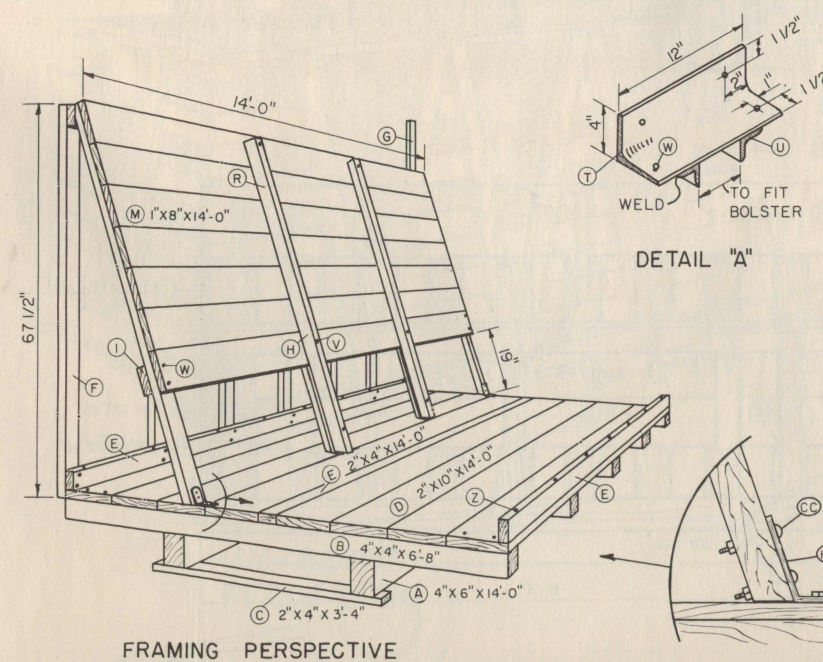
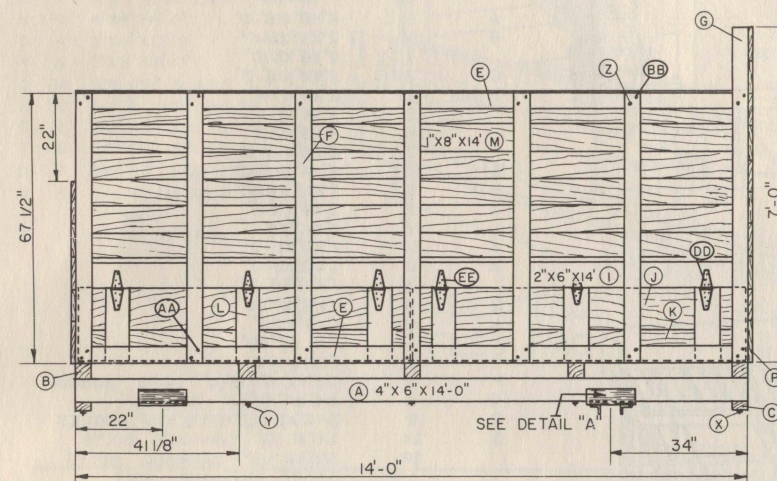
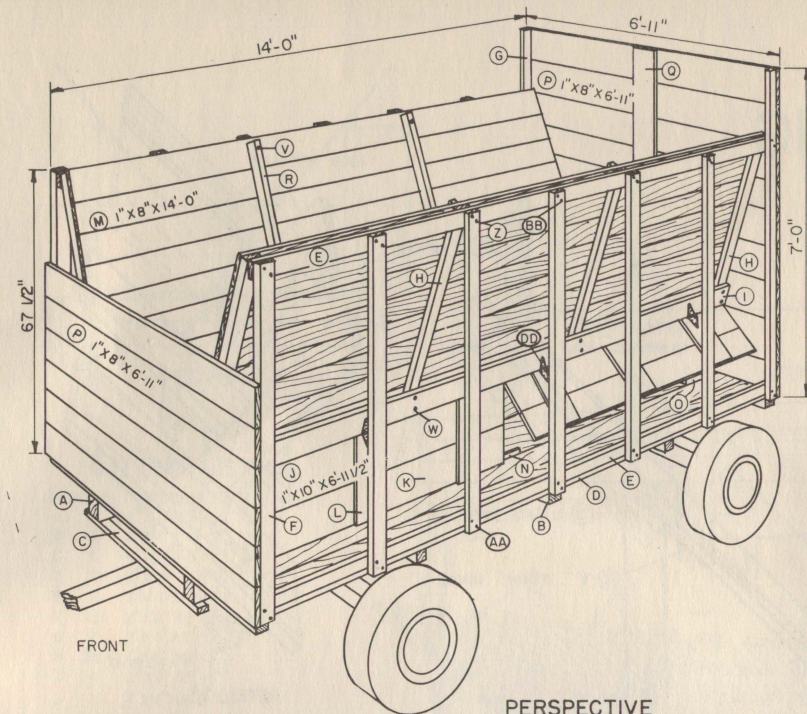
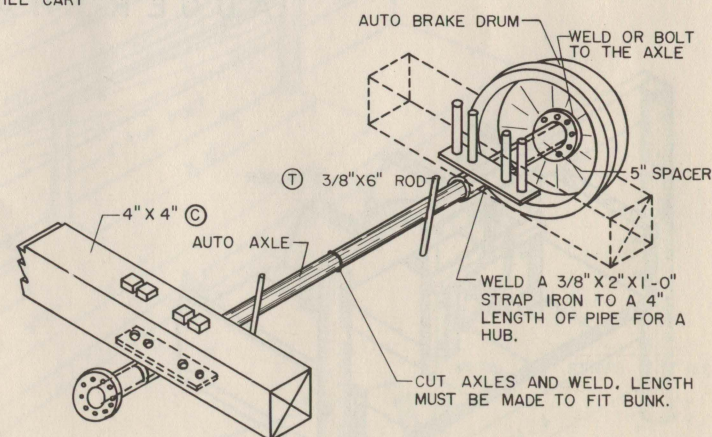
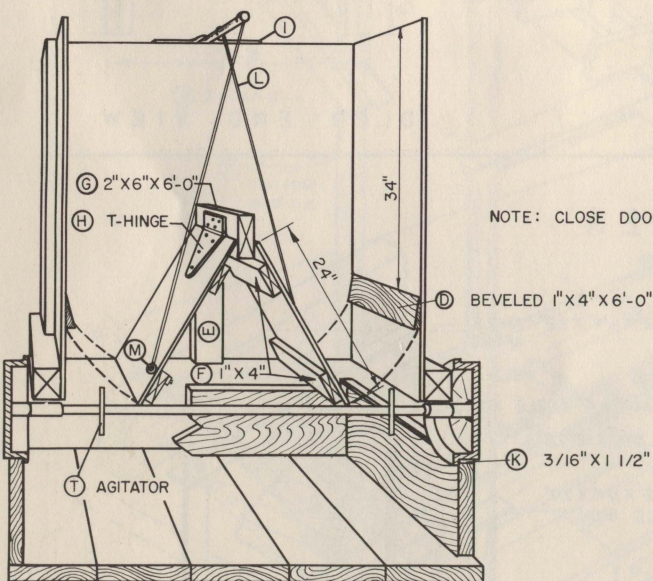
ITEM NO.	DESCRIPTION
A 6	2" X 4" X 3'-8"
B 4	2" X 4" X 4'-4"
C 2	4" X 4" X 6'-0"
D 2	1" X 4" X 6'-0"
E 2	2" X 4" X 18"
F 4	1" X 4" X 6'-0"
G 1	2" X 6" X 6'-0"
H 4	6" T-HINGES
I 6	3/16" X 1" X 12" STRAP
J 1	3/16" X 1" X 19" STRAP
K 1	3/16" X 1 1/2" TRACK AS REQ'D.
L 4	4'-4" CABLES
M 4	EYE BOLTS
N 1	1" X 7'-0" SHAFT
O 1	WHEEL & RATCHET
P 2	WHEEL & AXLE ASSEMBLY
Q 8	3/8" X 4 1/2" BOLTS
R 8	3/8" X 6 1/2" BOLTS
S 8	1/4" X 3" LAG SCREWS
T 4	3/8" X 6" RODS
	PLYWOOD
	3/8" C-C EXTERIOR TYPE
	2 ENDS 4'-0" X 4'-0"
	2 SIDES 4'-0" X 6'-0"
	2 DOORS 2'-0" X 6'-0"



① 3/16" X 1" X 12" STRAP
IRON BENT AS SHOWN

ISOMETRIC

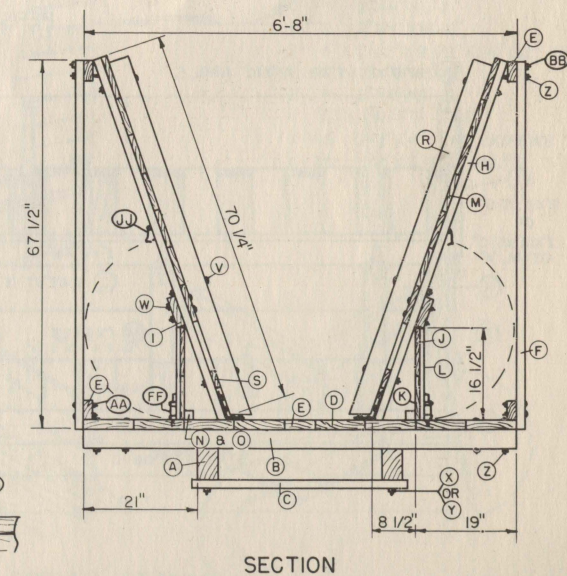
NOTE: CLOSE DOORS TO FILL CART



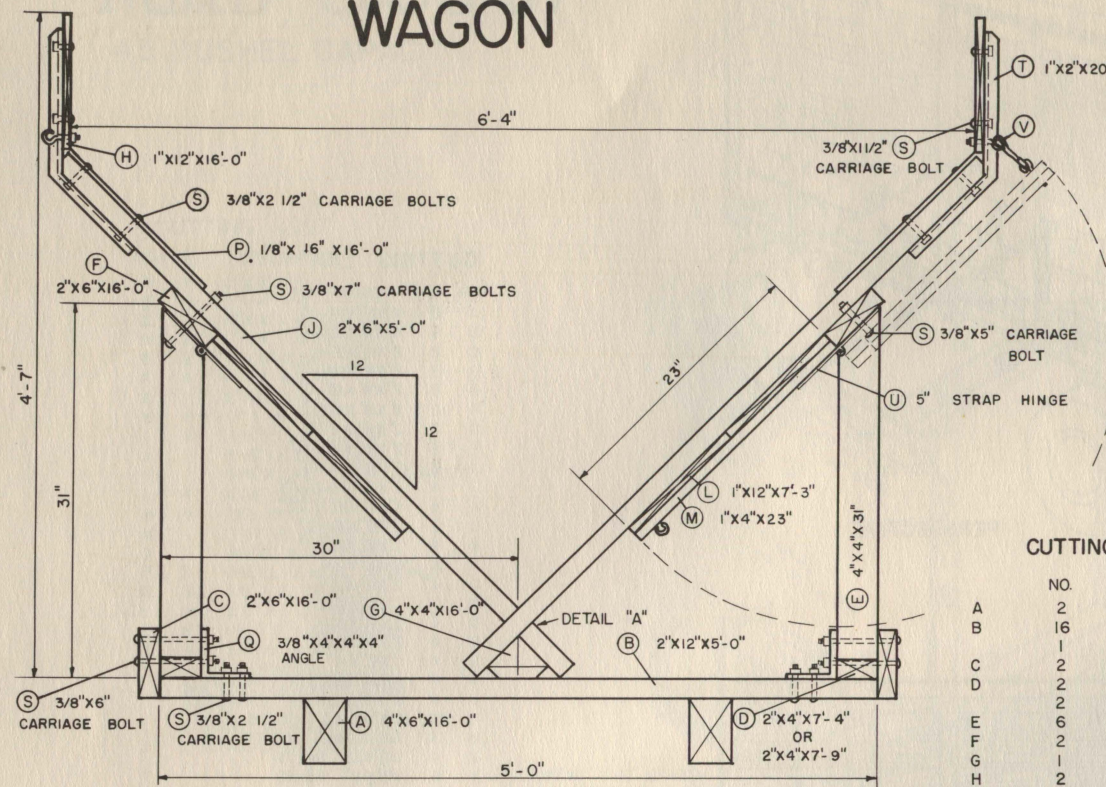
SELF - FEEDING WAGON RACK

CUTTING LIST

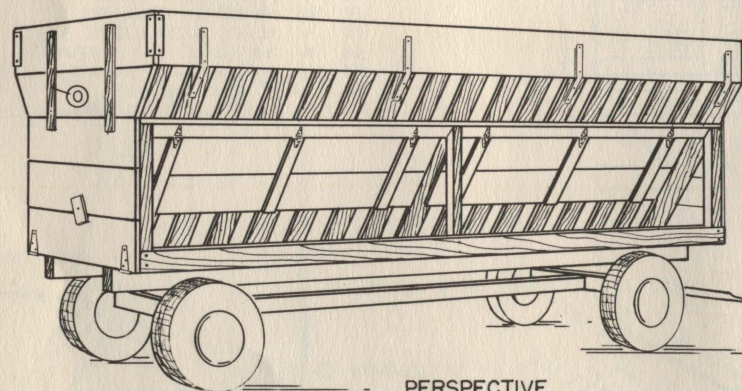
ITEM NO.	DESCRIPTION
A 2	4" X 6" X 14'-0"
B 5	4" X 4" X 6'-8"
C 2	2" X 4" X 3'-4"
D 8	2" X 10" X 14'-0"
E 5	2" X 4" X 14'-0"
F 12	2" X 4" X 67 1/2"
G 2	2" X 4" X 7'-0"
H 8	2" X 4" X 70 1/4"
I 2	2" X 6" X 14'-0"
J 4	1" X 10" X 6'-11 1/2"
K 4	1" X 8" X 6'-11 1/2"
L 12	1" X 6" X 16 1/2"
M 14	1" X 8" X 14'-0"
N 2	2" X 2" X 24"
O 4	2" X 2" X 12"
P 17	1" X 8" X 6'-11"
Q 1	1" X 6" X 6'-10"
R 4	2" X 4" X 5'-10"
S 4	1" X 2" X 4"
T 4	4" X 4" X 1/4" X 12" ANGLES
U 4	2" X 2" X 3/8" X 4" ANGLES
V 20	3/8" X 6 1/2" BOLTS
W 24	3/8" X 4 1/2" BOLTS
X 4	1/2" X 12" BOLTS
Y 6	1/2" X 10" BOLTS
Z 48	3/8" X 6" BOLTS
AA 28	3/8" X 3 1/2" BOLTS
BB 14	3/8" X 5" BOLTS
CC 24	3/8" X 2 1/2" BOLTS
DD 6 PR.	5" STRAP HINGES
EE 96	1/4" X 2" FH STOVE BOLTS
FF 4	HEAVY DUTY SLIDING BOLTS
GG 8	3/8" X 2 1/2" LAG SCREWS
HH 8	3/16" X 2 1/2" X 7" STRAPS
JJ 4	4" HOOK AND EYE



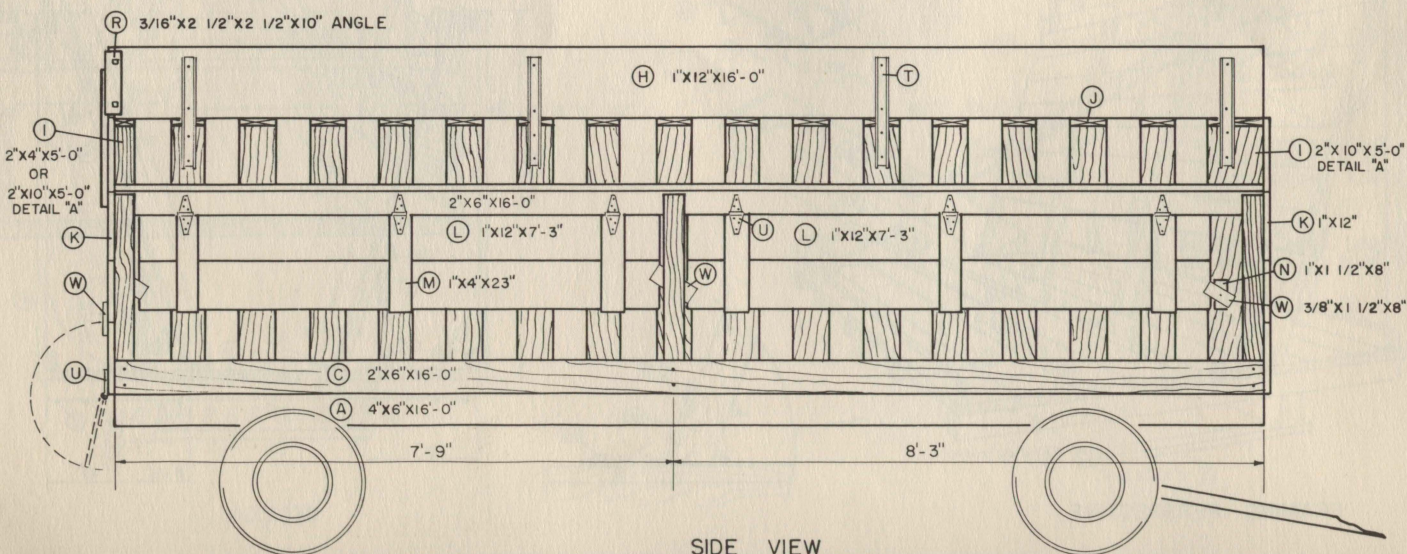
SLATTED FEEDING WAGON



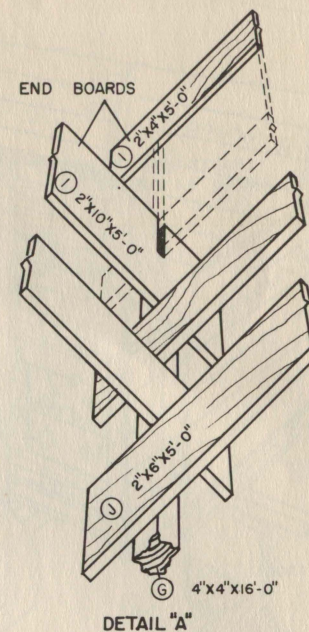
CROSS SECTION



PERSPECTIVE



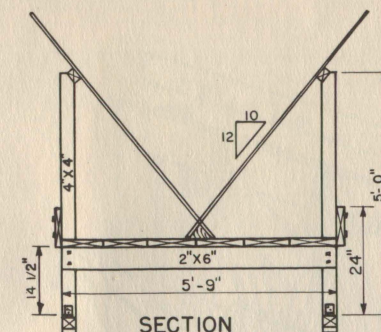
SIDE VIEW



DETAIL "A"

CUTTING LIST

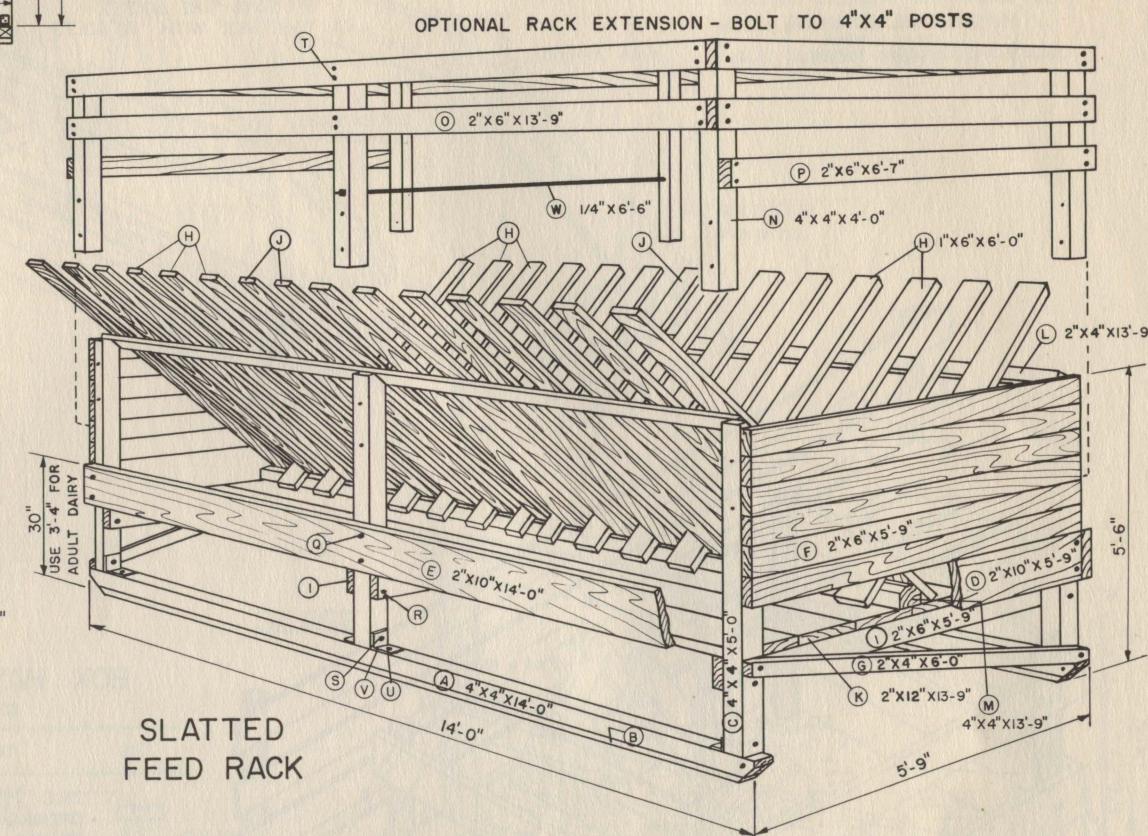
	NO.	DESCRIPTION
A	2	4"x6"x16'-0"
B	16	2"x12"x5'-0"
	1	2"x8"x5'-0"
C	2	2"x6"x16'-0"
D	2	2"x4"-7'-4"
	2	2"x4"x7'-9"
E	6	4"x4"x2'-7"
F	2	2"x6"x16'-0"
G	1	4"x4"x16'-0"
H	2	1"x12"x16'-0"
I	2	2"x4"x5'-0"
	2	2"x10"x5'-0"
J	30	2"x6"x5'-0"
K	6	1"x12"x5'-0"
	3	1"x12"x6'-6"
L	8	1"x12"x7'-3"
M	12	1"x4"x2'3"
N	6	1"x1'2"x8"
O	2	1"x4"x2'-6"
P	2	1/8"x1'-4"x16'-0"
Q	6	3/8"x4"x4"x4" ANGLE
R	2	3/16"x2' 1/2"x2' 1/2"x10" ANGLES
S	24	3/8"x1' 1/2" CARRIAGE BOLTS
	28	3/8"x2' 1/2" CARRIAGE BOLTS
	1	3/8"x5" CARRIAGE BOLT
	12	3/8"x6" CARRIAGE BOLTS
	5	3/8"x7" CARRIAGE BOLTS
T	8	1"x2"x1'-8" CHANNEL
U	12	5" STRAP HINGES
V	4	5" HOOK AND EYE
W	6	3/8"x1' 1/2"x8" STRAPS



SECTION

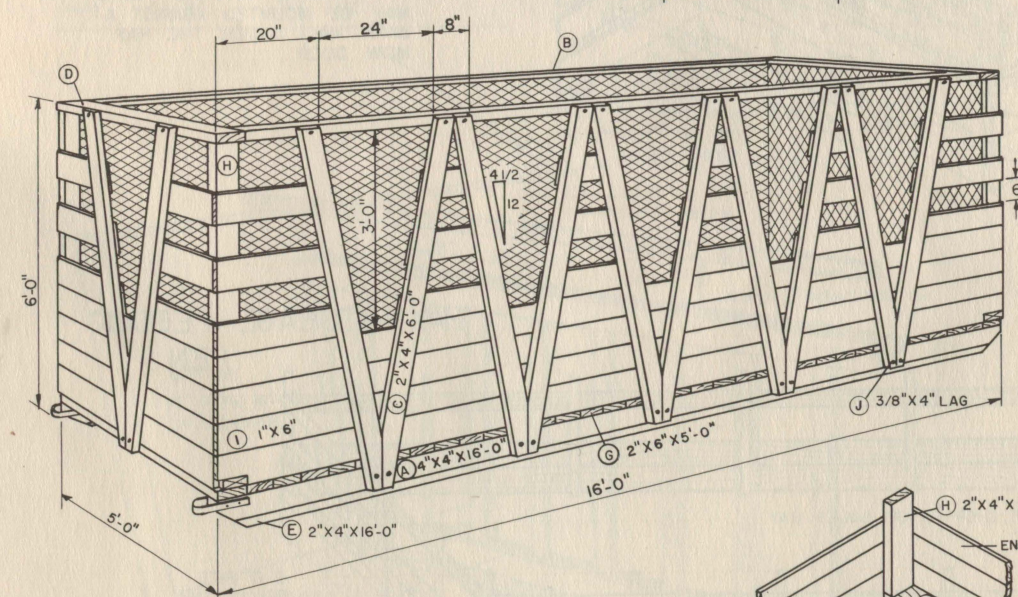
CUTTING LIST

ITEM NO.	DESCRIPTION
A 2	4" X 4" X 14'-0"
B 2	2" X 4" X 14'-0"
C 6	4" X 4" X 5'-0"
D 2	2" X 10" X 5'-9"
E 2	2" X 10" X 14'-0"
F 12	2" X 6" X 5'-9"
G 2	2" X 4" X 6'-0"
H 26	1" X 6" X 6'-0"
I 4	2" X 6" X 5'-9"
J 3	1" X 4" X 6'-0"
K 6	2" X 12" X 13'-9"
L 2	2" X 4" X 13'-9"
M 1	4" X 4" X 13'-9"
N 6	4" X 4" X 4'-0"
O 4	2" X 6" X 13'-9"
P 6	2" X 6" X 6'-7"
Q 26	3/8" X 6" BOLTS
R 30	3/8" X 7 1/2" BOLTS
S 6	3/8" X 5" BOLTS
T 48	1/4" X 6" BOLTS
U 8	3/8" X 3" LAG SCREWS
V 8	3/8" X 3 1/2" X 3 1/2" X 3 1/2" ANGLES
W 1	1/4" X 6'-6" ROD

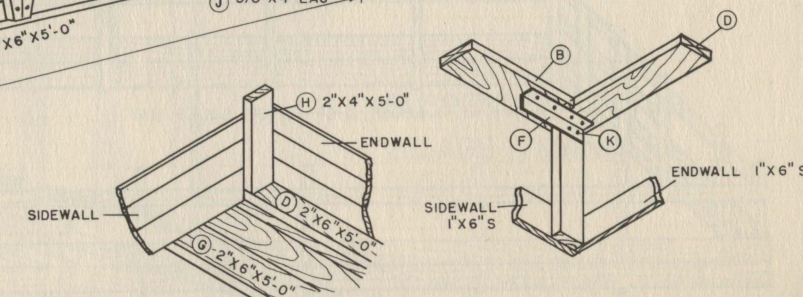


SLATTED
FEED RACK

ALL LUMBER
PRESSURE-TREATED



HAY-SAVING FEED RACK



CORNER DETAILS

PORTABLE HAY RACKS

CUTTING LIST

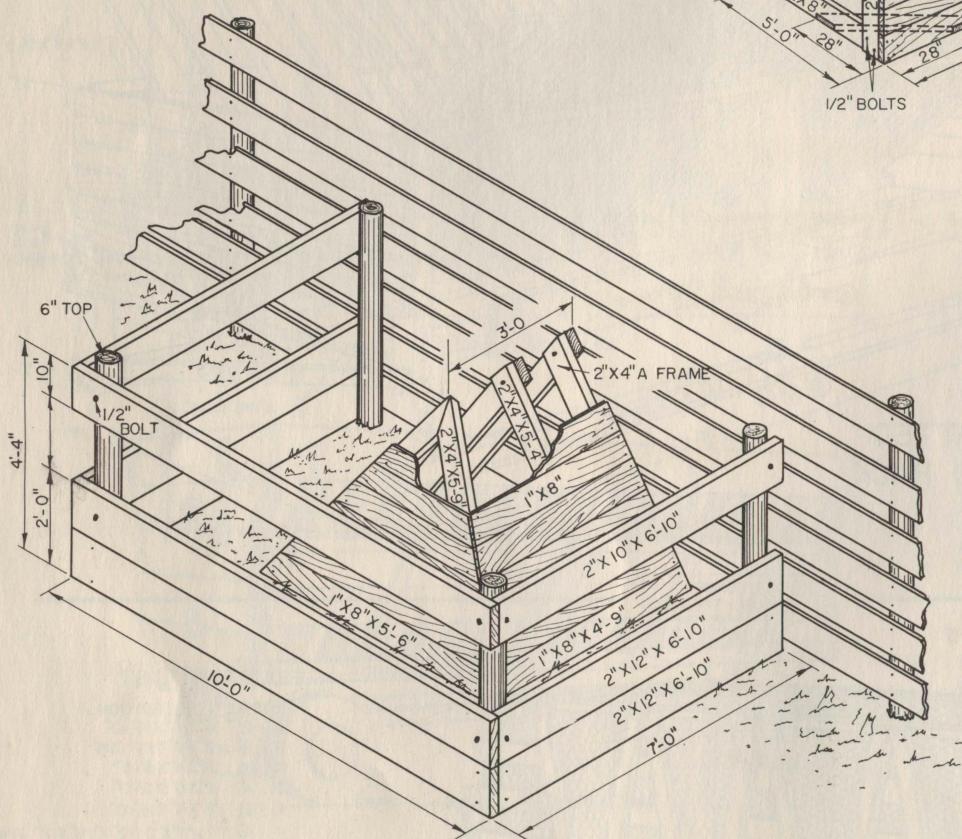
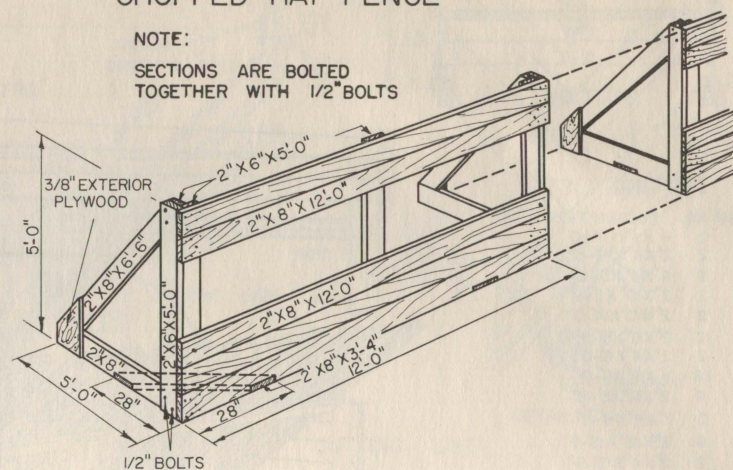
ITEM NO.	DESCRIPTION
A 2	4" X 4" X 16'-0"
B 2	2" X 6" X 15'- 3/4"
C 24	2" X 4" X 6'-0"
D 4	2" X 6" X 5'-0"
E 2	2" X 4" X 16'-0"
F 4	2 1/2" X 2 1/2" X 1/4" X 12" ANGLE
G 36	2" X 6" X 5'-0"
H 4	2" X 4" X 5'-2"
I 232	LN. FT. 1" X 6"
J 48	3/8" X 4" LAG SCREWS
K 24	1/2" X 2 1/2" BOLTS

FENCE FEEDERS

CHOPPED HAY FENCE

NOTE:
SECTIONS ARE BOLTED
TOGETHER WITH 1/2" BOLTS

ALL LUMBER
PRESSURE-TREATED

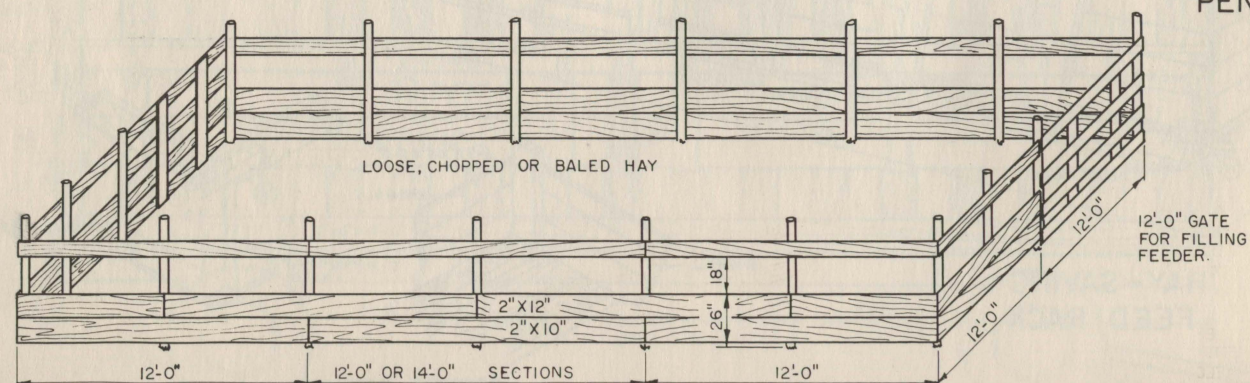


BOX HAY OR SILAGE FEEDER

THIS TYPE OF FEEDING
OPENING WORKS WELL FOR
SILAGE. MOUNT FEEDER NEXT
TO SERVICE ALLEY.

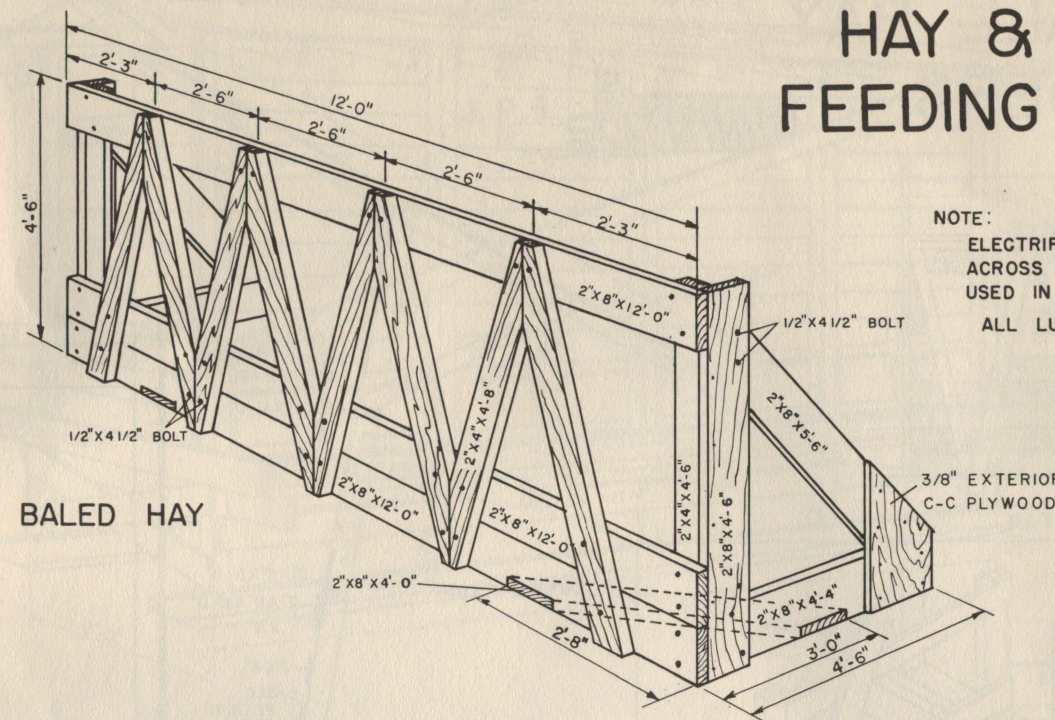
FOR FEEDING HAY, THE FEEDER
MAY BE MOUNTED AGAINST A
BARN WALL UNDER THE HAY
MOW DOOR.

HAY STORAGE - FEEDING PEN



HAY & SILAGE FEEDING FENCES

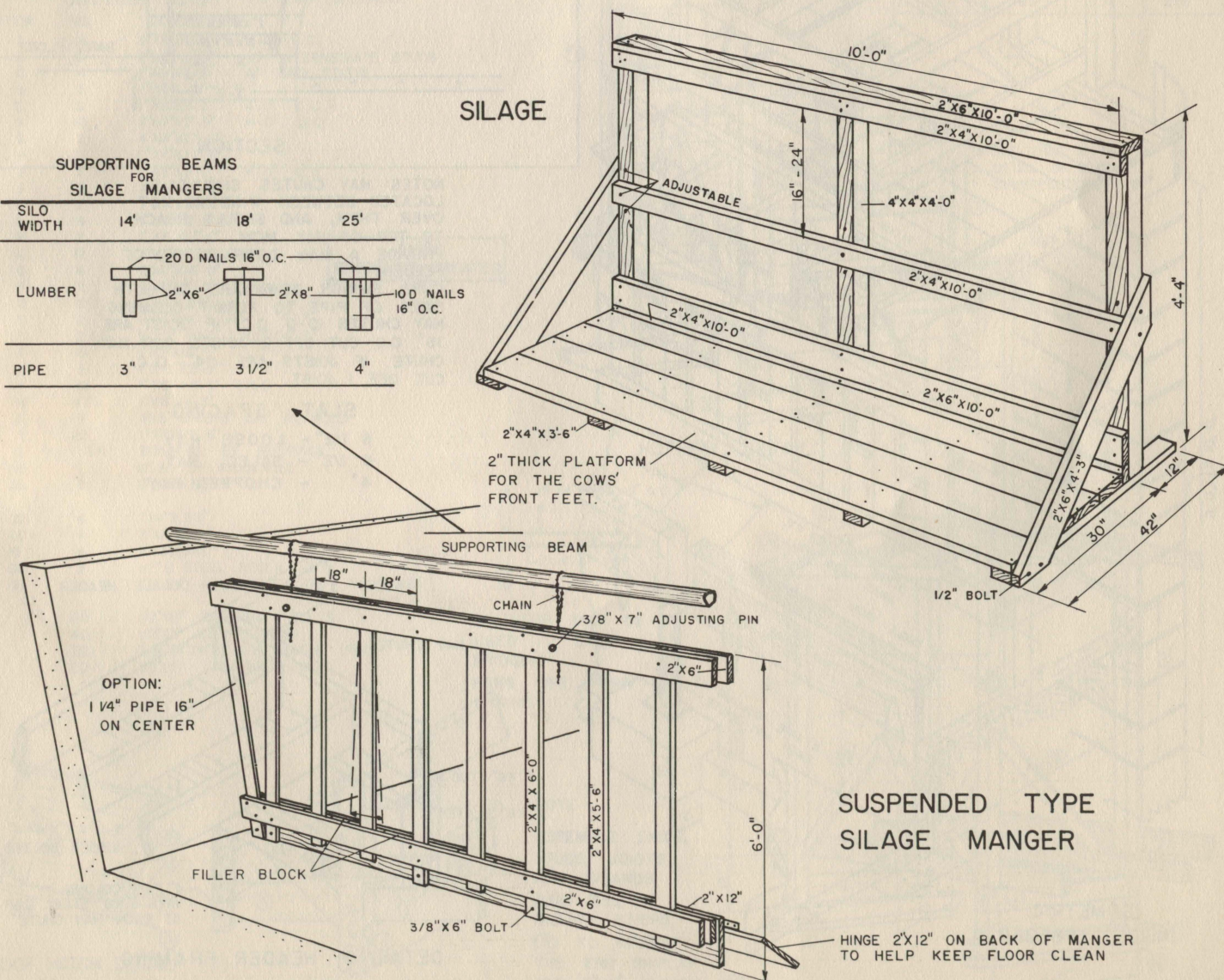
NOTE:
ELECTRIFIED PIPE OR FENCE WIRE
ACROSS TRENCH SILO CAN BE
USED IN PLACE OF MANGER.
ALL LUMBER PRESSURE-TREATED



BALED HAY

SILAGE

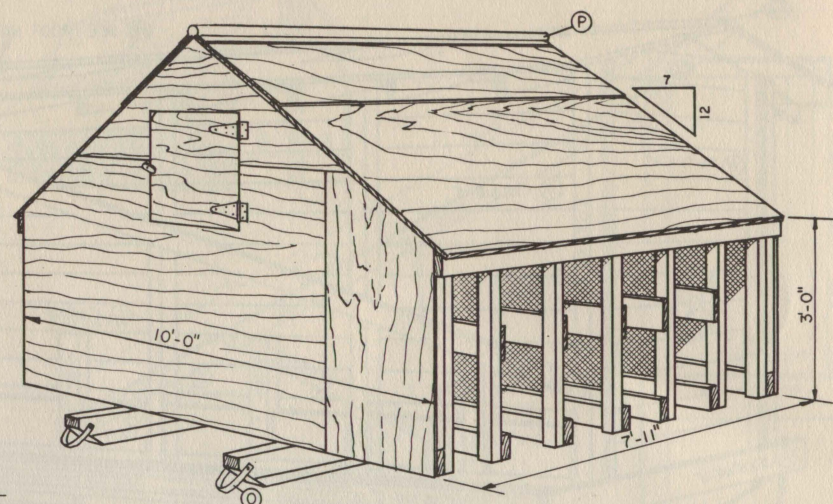
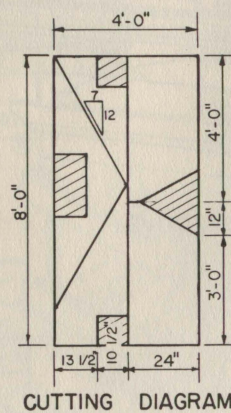
	SUPPORTING BEAMS FOR SILAGE MANGERS		
SILO WIDTH	14'	18'	25'
LUMBER	20 D NAILS 16" O.C. 2" x 6"	2" x 8"	10 D NAILS 16" O.C. 2" x 8"
PIPE	3"	3 1/2"	4"



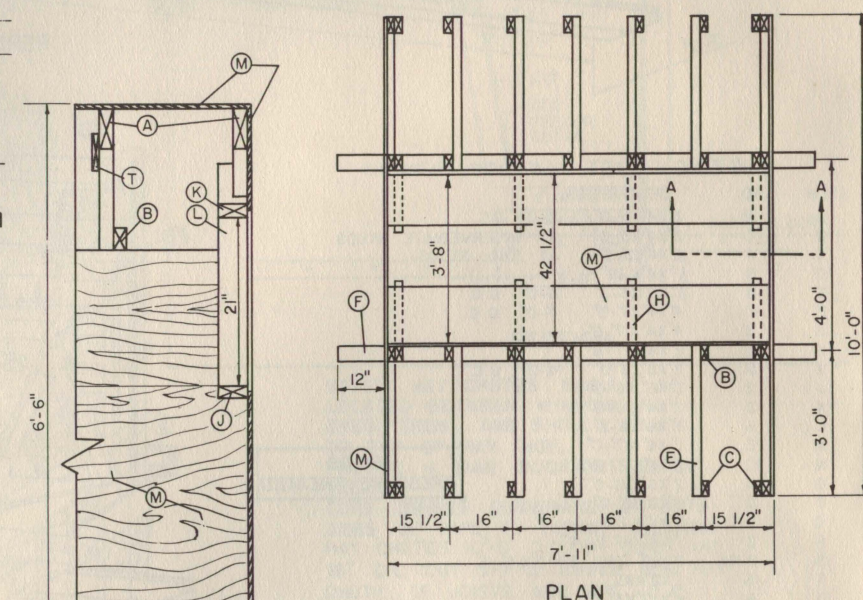
CALF CREEP FEEDER 42 BU.

CUTTING LIST

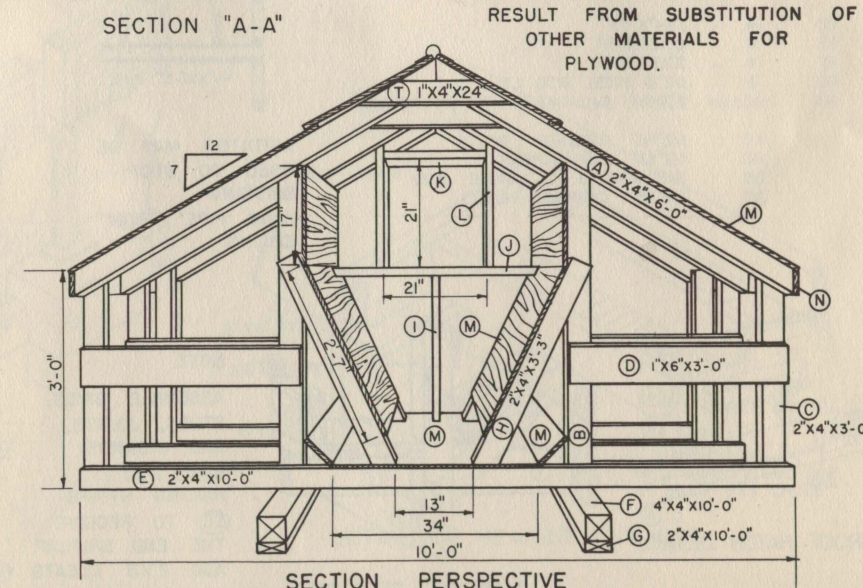
ITEM	NO.	DESCRIPTION
A	14	2"x4"x6'-0"
B	14	2"x4"x4'-6"
C	18	2"x4"x3'-0"
D	10	1"x6"x3'-0"
E	7	2"x4"x10'-0"
F	2	4"x4"x10'-0"
G	2	2"x4"x10'-0"
H	8	2"x4"x3'-3"
I	2	2"x4"x32"
J	2	2"x4"x3'-8 1/2"
K	2	2"x4"x21"
L	2	2"x4"x24"
M	9 1/4	4'x8'x3/8" PLYWOOD
		3 - ROOF
		1 - FLOOR
		2 - HOPPER
		3 - ENDS
		2 - 2'x2' DOOR
N	2	1"x6"x7'-11"
O	2	CLEVIS
P	1	8' RIDGEROLL
Q	24	1"x2"x24"
R	12	2"x4"x23"
S	12	5/8"x12"x12 3/4" PLYWOOD
		(4' WIDE, 3'-3" LONG SHEET)
T	5	1"x4"x24"



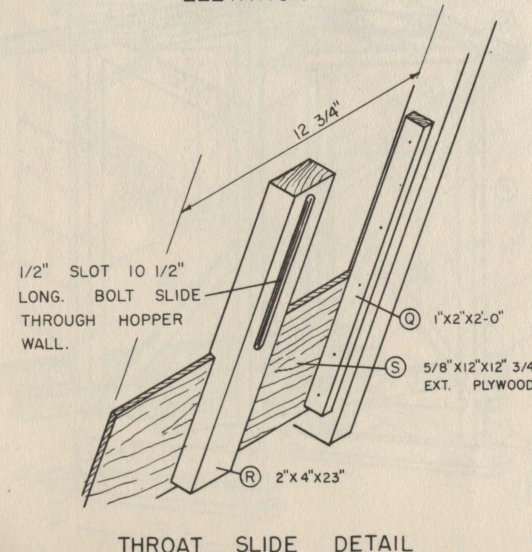
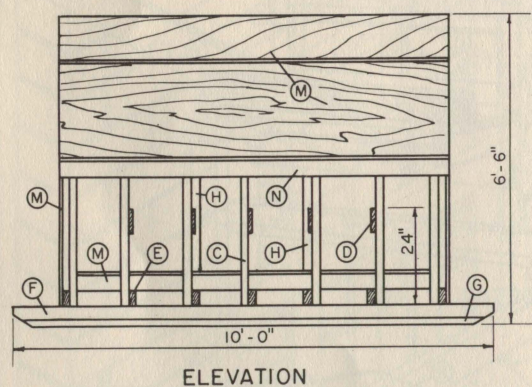
PERSPECTIVE



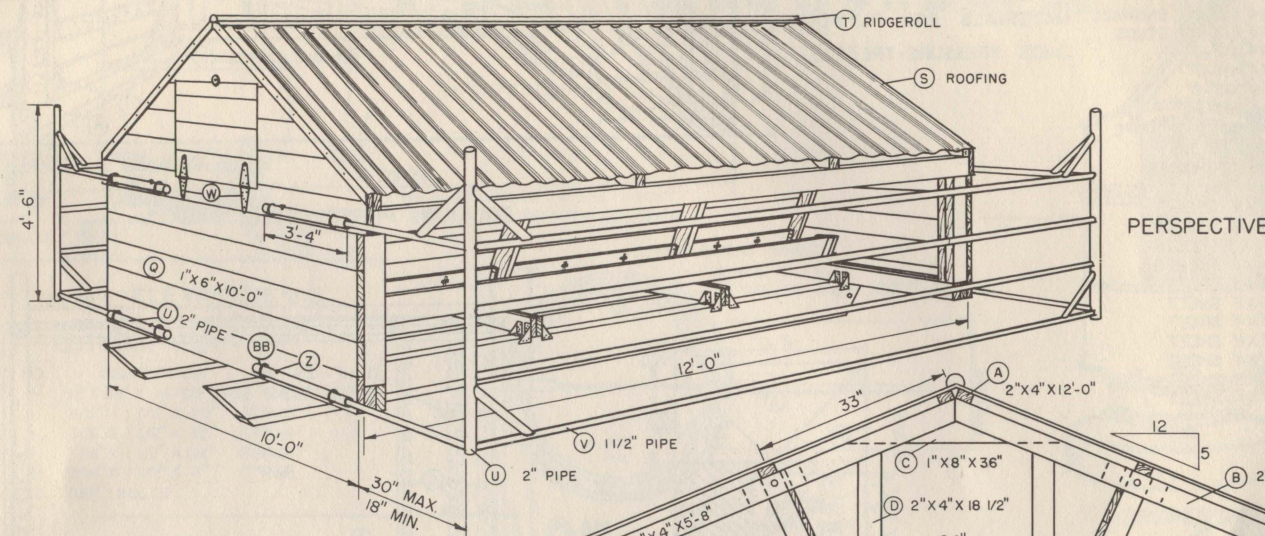
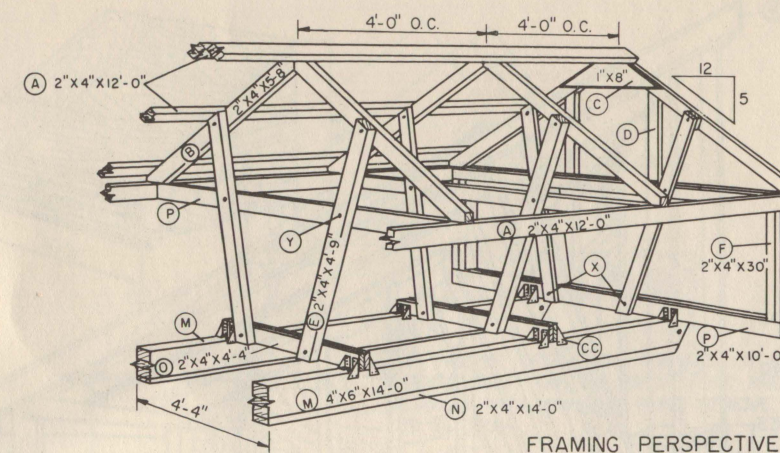
NOTE.
NAIL & GLUE PLYWOOD TO STUDS,
RAFTERS, ETC. WITH TYPE A
CASEIN & 6D GALV. BOX NAILS.
STRUCTURAL DEFICIENCIES MAY
RESULT FROM SUBSTITUTION OF
OTHER MATERIALS FOR
PLYWOOD.



SECTION PERSPECTIVE



CALF CREEP FEEDER 55 BU.



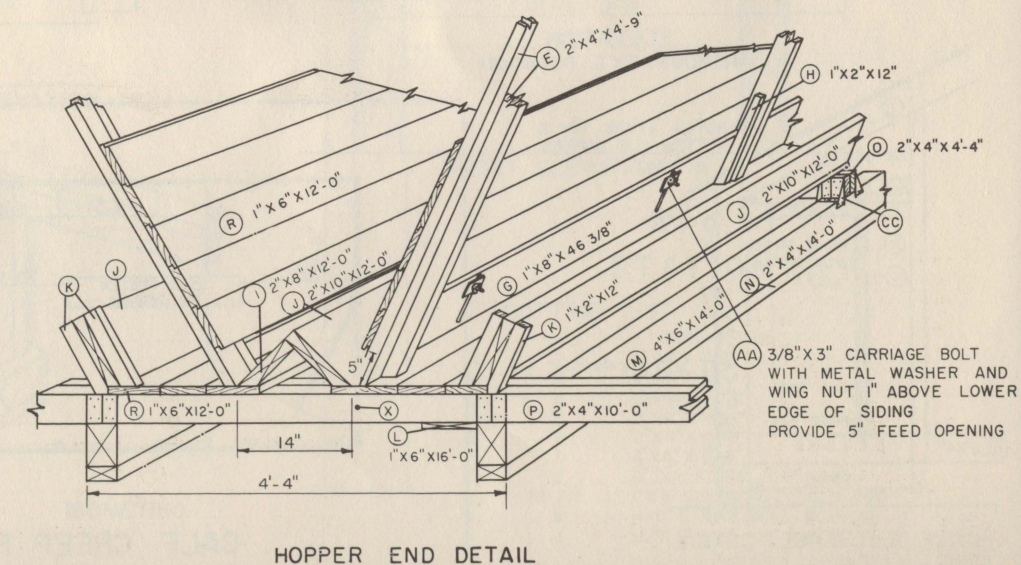
NOTES:

TWO END TRUSSES AND TWO
INTERMEDIATE TRUSSES ARE
REQUIRED, SPACED 4'-0" O.C.
SKIDS AND FLOOR FRAMING
OF PRESSURE TREATED LUMBER.
PLACE DOORS AT BOTH ENDS
FOR HAND FILLING, OPENING
24" WIDE.

CUTTING LIST

ITEM	NO.	DESCRIPTION
A	8	2"x4"x12'-0"
B	8	2"x4"x5'-8"
C	2	1"x8"x36"
D	4	2"x4"x18 1/2"
E	12	2"x4"x4'-9"
F	8	2"x4"x30"
G	6	1"x8"x46 3/8"
H	12	1"x2"x12"
I	1	2"x8"x12'-0"
J	3	2"x10"x12'-0"
K	8	1"x2"x12"
L	1	1"x6"x16'-0"
M	2	4"x6"x14'-0"
N	2	2"x4"x14'-0"
O	4	2"x4"x4'-4"
P	10	2"x4"x10'-0"
Q	18	1"x6"x10'-0"
R	26	1"x6"x12'-0"
S	1/2	SQ. 2 1/2" CORR.
T	1	12'-0" RIDGEROLL
U	2	2" DIA. X 44'-0" PIPE
V	1	1 1/2" DIA. X 160'-0" PIPE
W	4	6" STRAP HINGES
X	12	1/2"x6" BOLTS
Y	12	1/2"x4 1/2" BOLTS
Z	8	3/8"x3" PINS
AA	12	3/8"x3" BOLTS WITH WING NUTS
BB	16	2 1/2" DIA. U-BOLTS
CC	24	METAL FRAMING ANCHORS

NOTE: OMIT FLOOR UNDER HOPPER
VEE TO AVOID RODENT HARBOR



END FRAMING

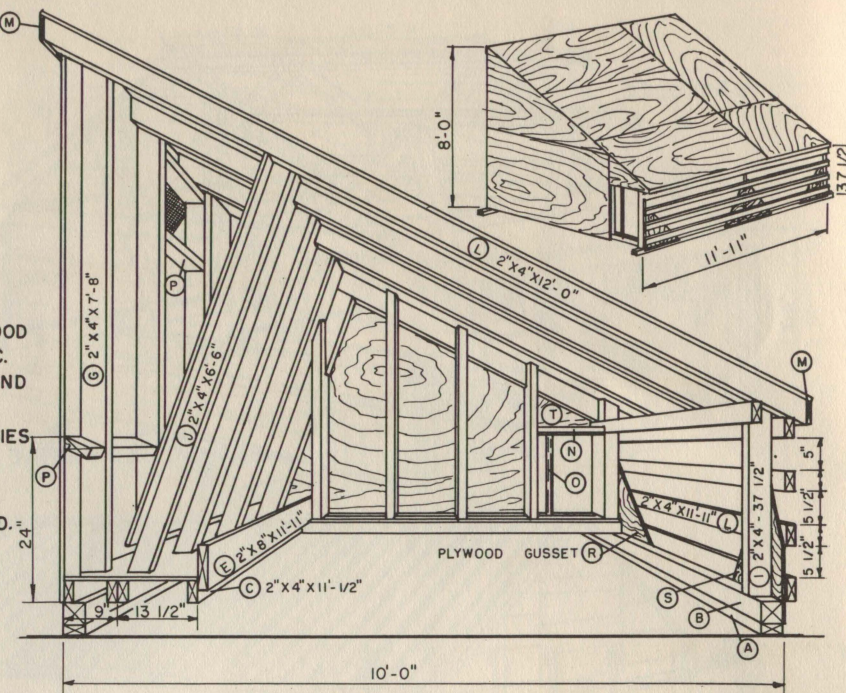
CALF CREEPS

70 BU. PORTABLE FEEDER - SHELTER

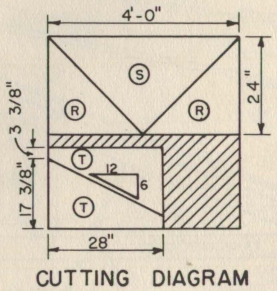
CUTTING LIST

ITEM NO.	DESCRIPTION
A	2 2"x4"x14'-0"
B	2 4"x4"x14'-0"
C	4 2"x4"x11'-1/2"
D	2 2"x4"x10'-0"
E	1 2"x8"x11'-11"
F	2 4"x4"x8'-0"
G	5 2"x4"x7'-8"
H	2 4"x4"x37 1/2"
I	1 2"x4"x37 1/2"
J	7 2"x4"x6'-6"
K	2 2"x4"x10'-0" ENDWALL STUDS
L	2 2"x4"x12'-0"
M	5 2"x4"x11'-11"
N	2 1"x4"x12'-0"
O	2 2"x4"x20 1/2"
P	2 1 1/2" DIA. X 27" PIPE
Q	4 4" BUTT HINGES
R	3/8" C-C GRADE, EXT. PLYWOOD
S, T	1-4' X4' SHEET
BACK	3-4' X8' SHEETS
ENDS	3-4' X8' SHEETS
ROOF	4-4' X8' SHEETS
HOPPER	1-4' X4' SHEET
FLOOR	1-4' X8' SHEET
	1-2' X8' SHEET
	1-2' X4' SHEET
	1-2' X8' SHEET
	1-2' X4' SHEET

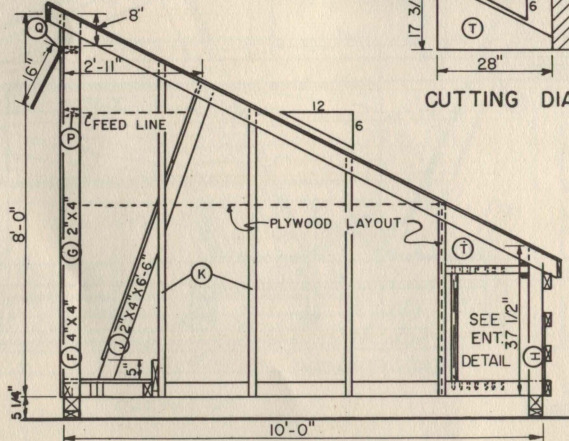
NOTE: NAIL AND GLUE PLYWOOD TO STUDS, RAFTERS, ETC. WITH GLUE, SEE PAGE 53 AND 6D GALV. BOX NAILS. STRUCTURAL DEFICIENCIES MAY RESULT FROM SUBSTITUTION OF OTHER MATERIALS FOR PLYWOOD. SKIDS PRESSURE-TREATED.



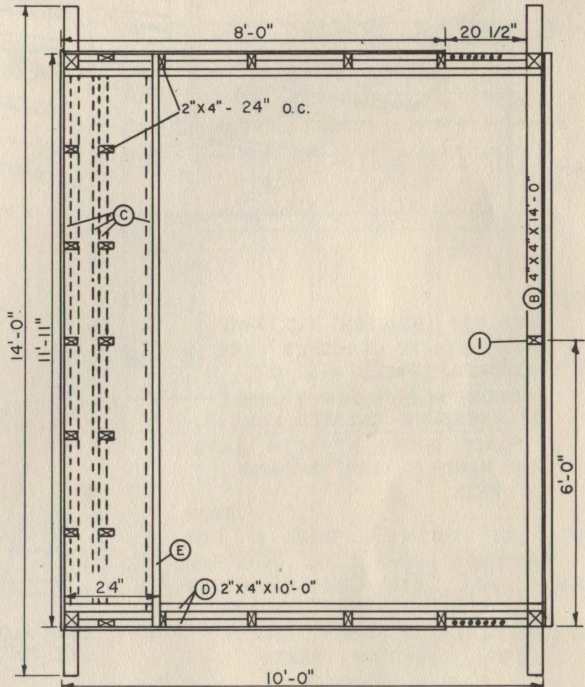
SECTION PERSPECTIVE



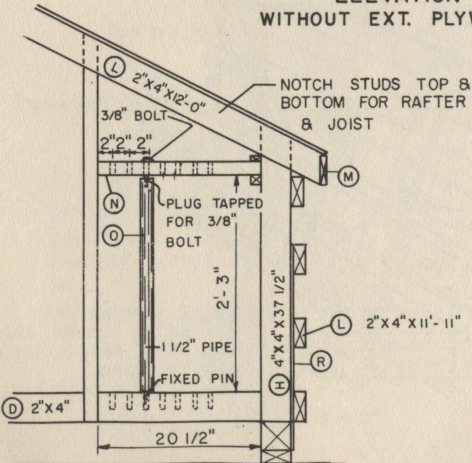
CUTTING DIAGRAM



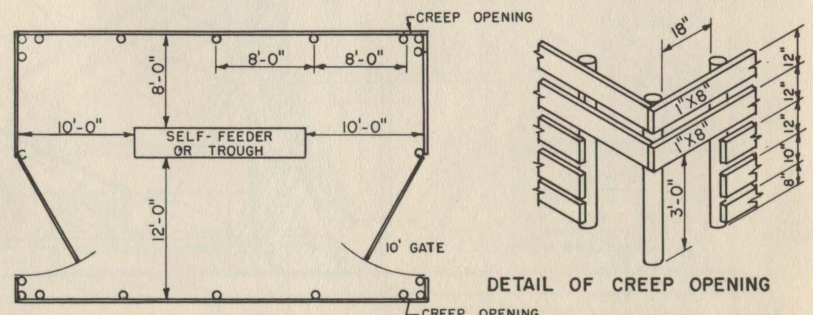
ELEVATION WITHOUT EXT. PLYWOOD



PLAN

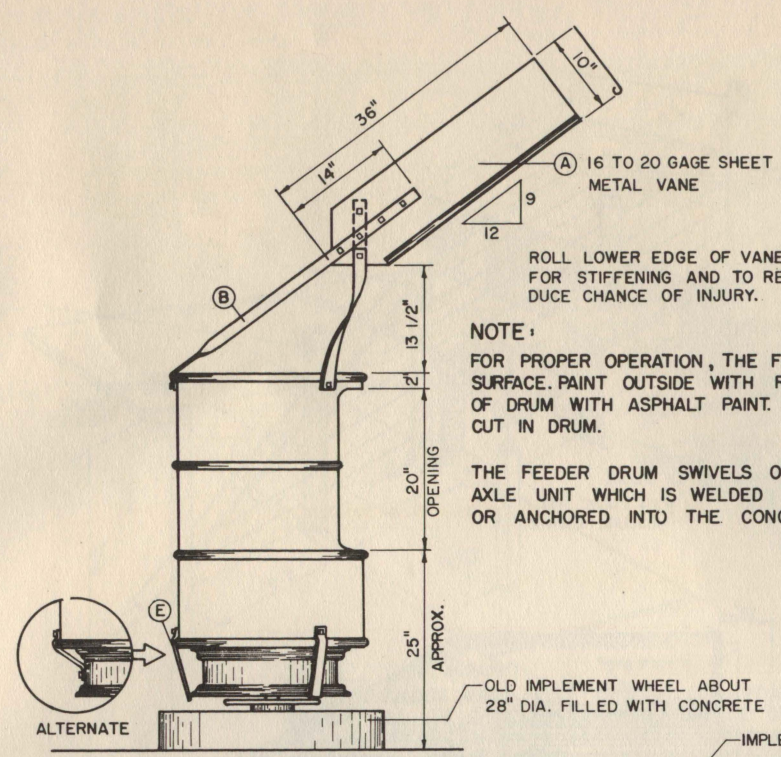


CALF ENTRANCE DETAIL



CALF CREEP FENCE

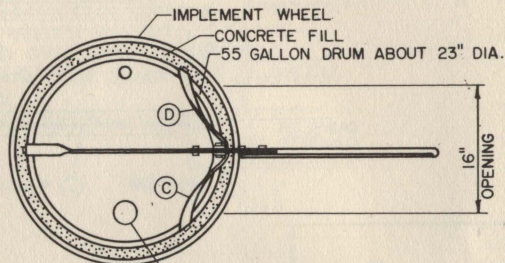
MINERAL FEEDERS



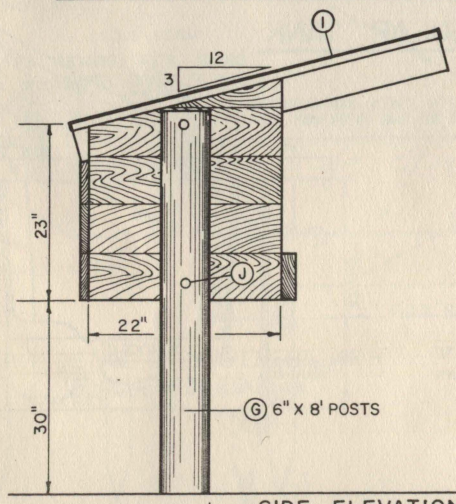
ELEVATION

CUTTING LIST

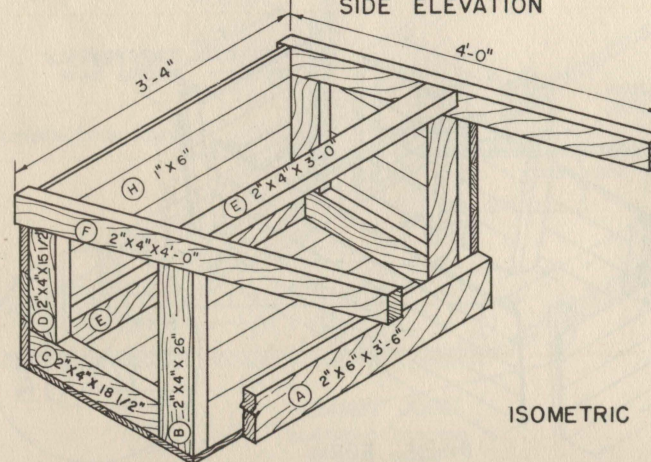
NO.	DESCRIPTION
A	1 12"x36" X 16-20 GAGE SHEET METAL
B	1 3/16" X 1 1/2" X 40" STRAP
C	1 3/16" X 1 1/2" X 22" STRAP
D	1 3/16" X 1 1/2" X 28" STRAP
E	3 3/16" X 1 1/2" X 8" STRAP
12	3/8" BOLTS



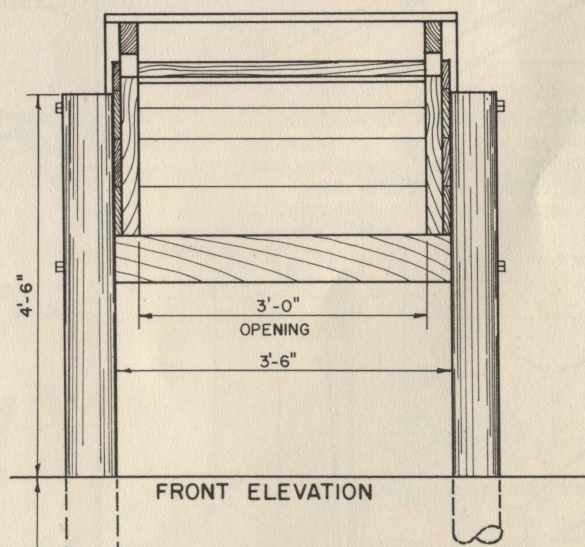
PLAN



SIDE ELEVATION



ISOMETRIC

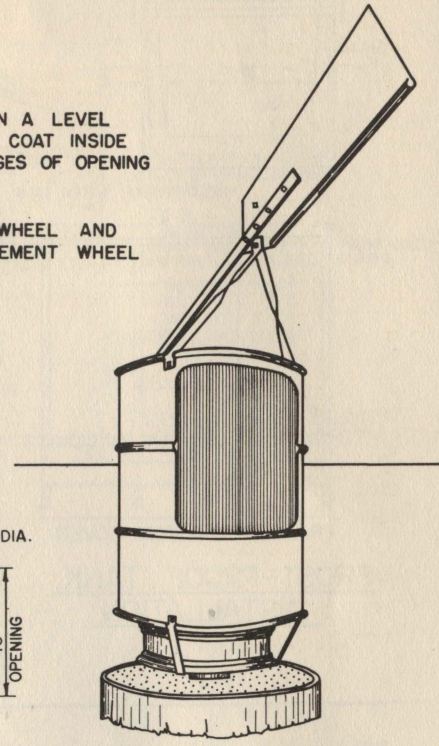


FRONT ELEVATION

STATIONARY

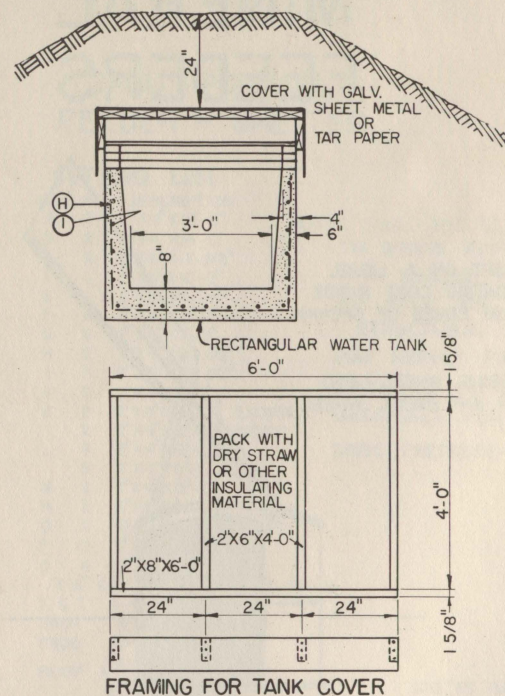
CUTTING LIST

NO.	DESCRIPTION
A	1 2"x6"x3'-6"
B	2 2"x4"x26"
C	2 2"x4"x18 1/2"
D	2 2"x4"x15 1/2"
E	2 2"x4"x3'-0"
F	2 2"x4"x4'-0"
G	2 6" DIA. POSTS, 8'-0" LONG
H	72 FT. 1"x6" SIDING, BOTTOM, & ROOF
I	2 4'-0" STRIPS ROLL ROOFING
J	4 1/2"x9" MACHINE BOLTS

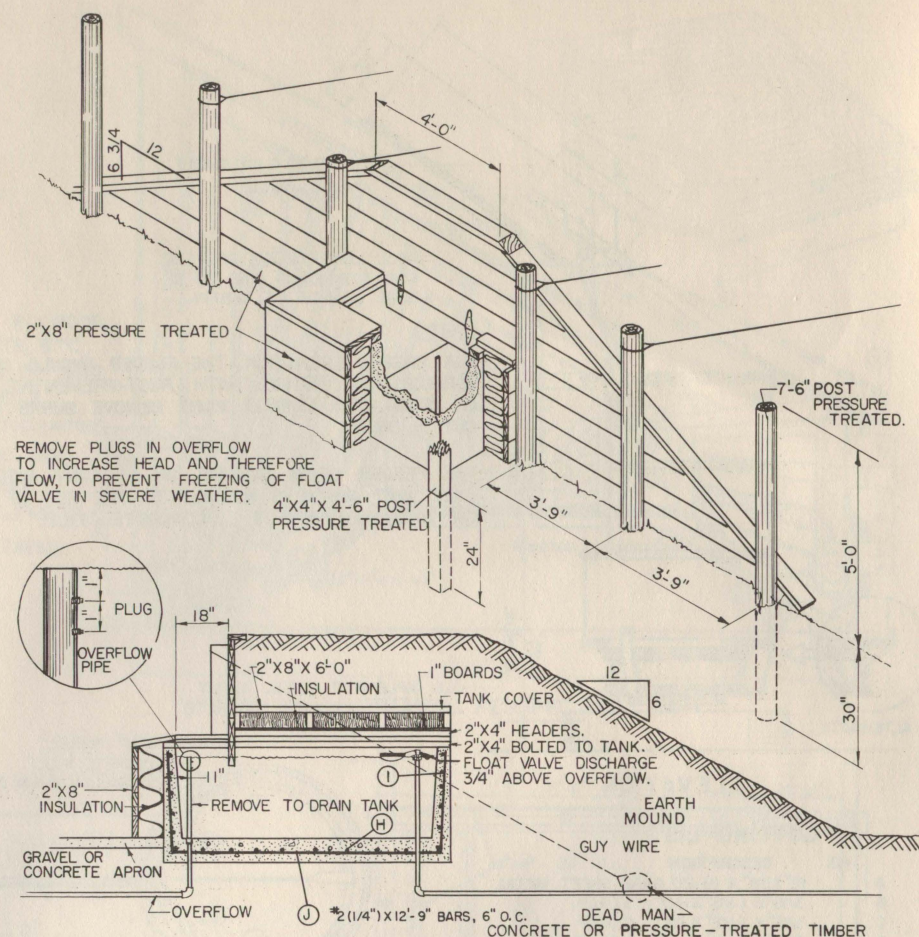


PERSPECTIVE WEATHERVANE

WATERERS



FROST-PROOF TANK INSTALLATION



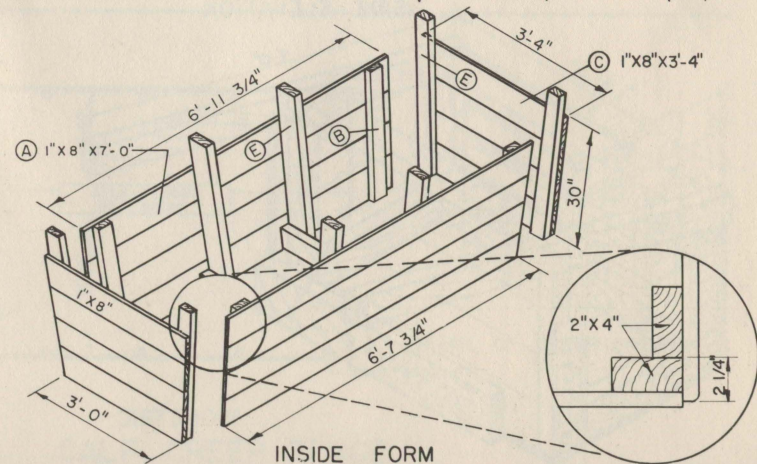
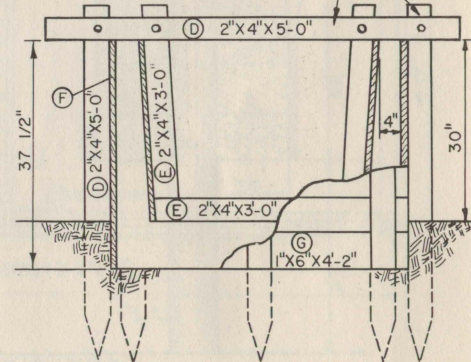
RECTANGULAR TANK

CUTTING LIST

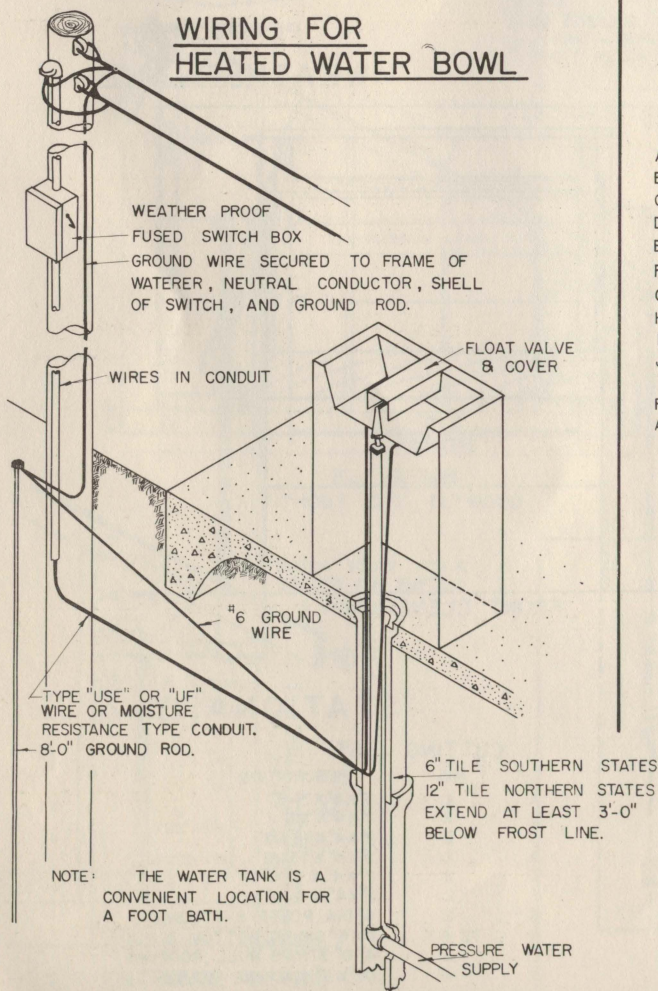
A	8	1"x8"x7'-0"
B	4	2"x4"x3'-0"
C	6	1"x8"x3'-4"
D	18	2"x4"x5'-0"
E	10	2"x4"x3'-0"
F	10	1"x8"x8'-0"
G	10	1"x8"x4'-2"
H	8	2 (1/4") x 8'-6"
I	6	2 (1/4") x 20'-0", 12" O.C.
J	6	2 (1/4") x 12'-9"

2 CU. YD. CONCRETE
REINFORCING RODS ARE SHOWN ABOVE.

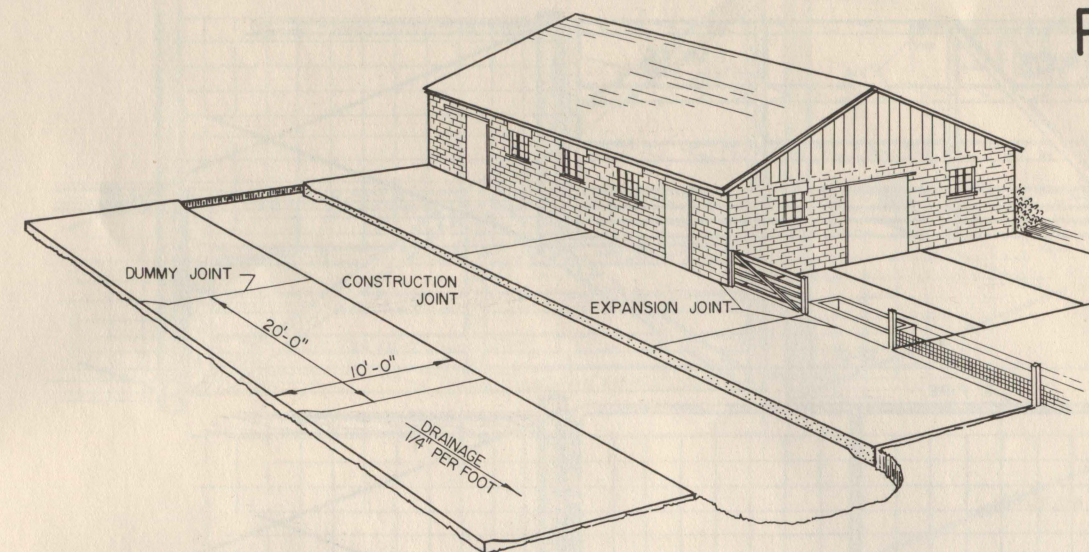
SPACE 2"x4" BRACES 24" O.C.
FOR 1" BOARD FORMS



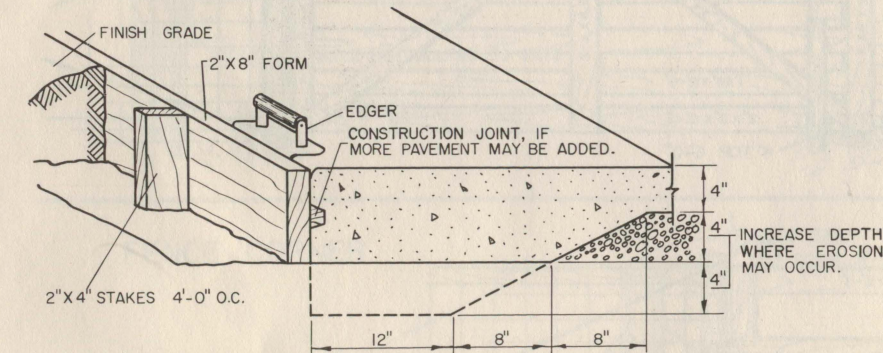
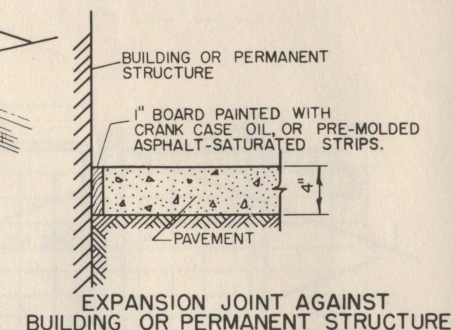
WIRING FOR HEATED WATER BOWL



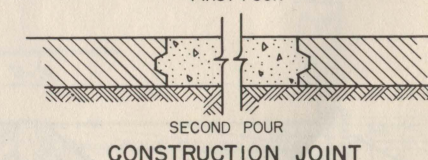
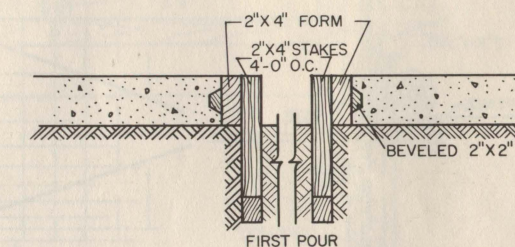
BARNYARD PAVEMENT



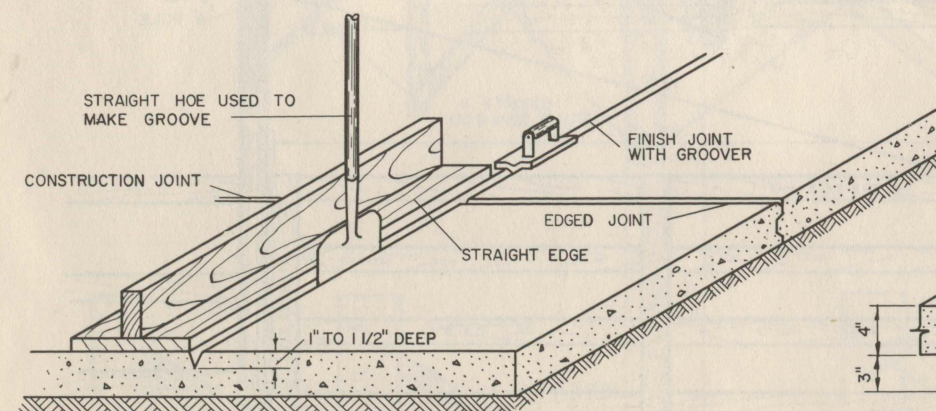
PLACE CONCRETE OVER WELL DRAINED UNDISTURBED SOIL, TAMPED SOIL, OR GRAVEL FILL. ALL SURFACE ORGANIC MATTER, MANURE, TRASH, & SOFT SOIL SHOULD BE REMOVED. REINFORCING WIRE (6"x6" #10 WELDED WIRE MESH) IS RECOMMENDED IN FLOORS POURED OVER SPONGY UNSTABLE SOILS. FINISH WITH WOOD FLOAT OR STIFF STABLE BROOM.



FORM DETAIL OF PAVEMENT WITH THICKENED EDGE

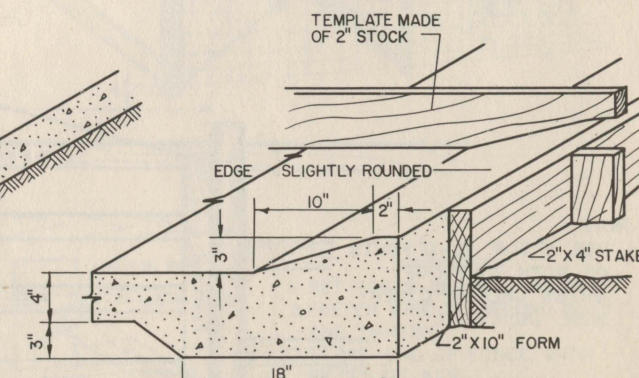


PREVENTS SETTLING BETWEEN SLABS POURED AT DIFFERENT TIMES.



DUMMY JOINT

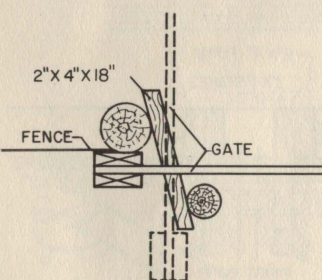
CONTROLS CRACKING IN LONG SLABS



DETAIL FOR LOW CURB AND FORMWORK

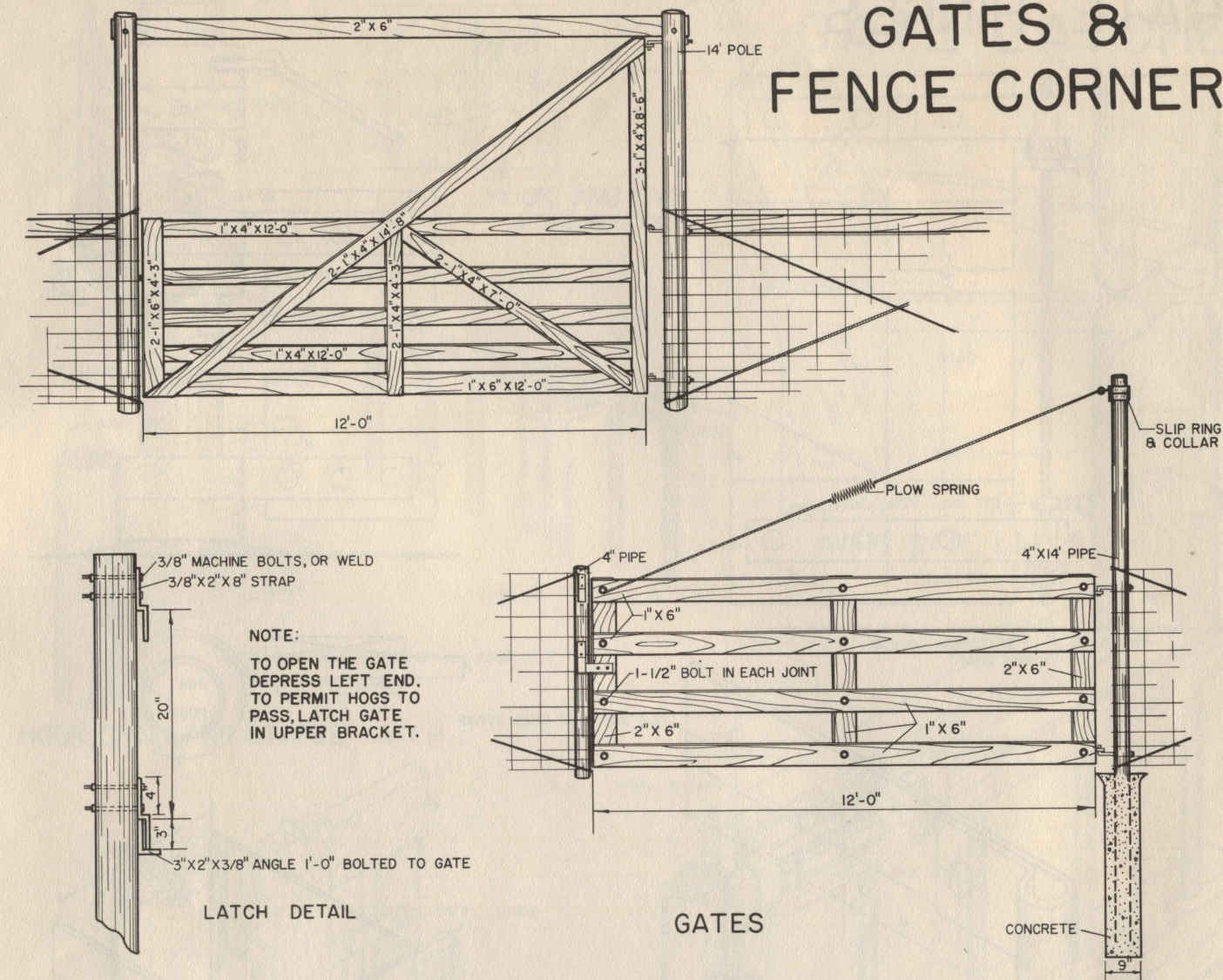
(PERMITS DRIVING OVER AND CONTROLS DRAINAGE WATER)

GATES



NOTE:
USE 6" TOP 10'-0" POSTS
ON BOTH SIDES OF
GATES UNLESS OTHER-
WISE INDICATED.

GATES & FENCE CORNER



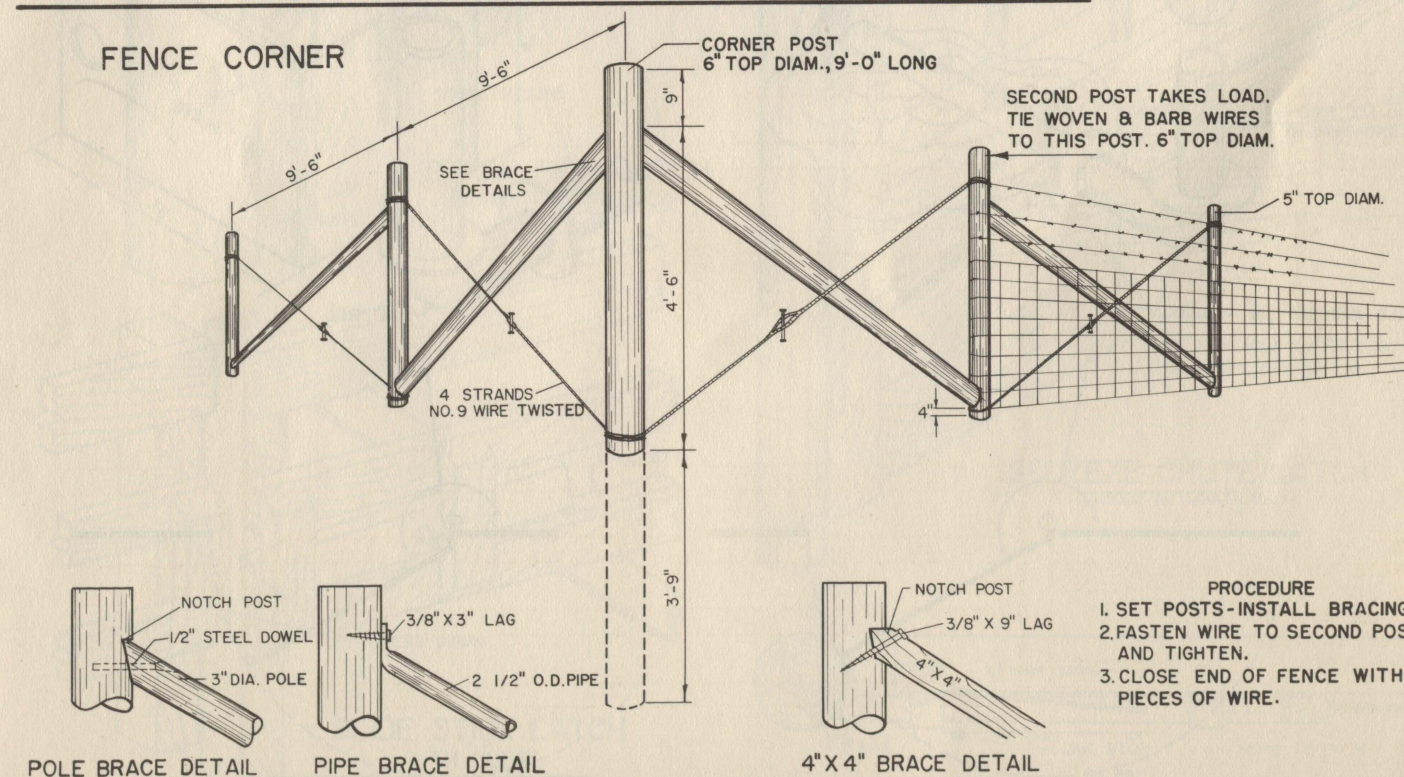
NOTE:

TO OPEN THE GATE
DEPRESS LEFT END.
TO PERMIT HOGS TO
PASS, LATCH GATE
IN UPPER BRACKET.

LATCH DETAIL

GATES

FENCE CORNER



SECOND POST TAKES LOAD.
TIE WOVEN & BARB WIRES
TO THIS POST. 6" TOP DIAM

PROCEDURE

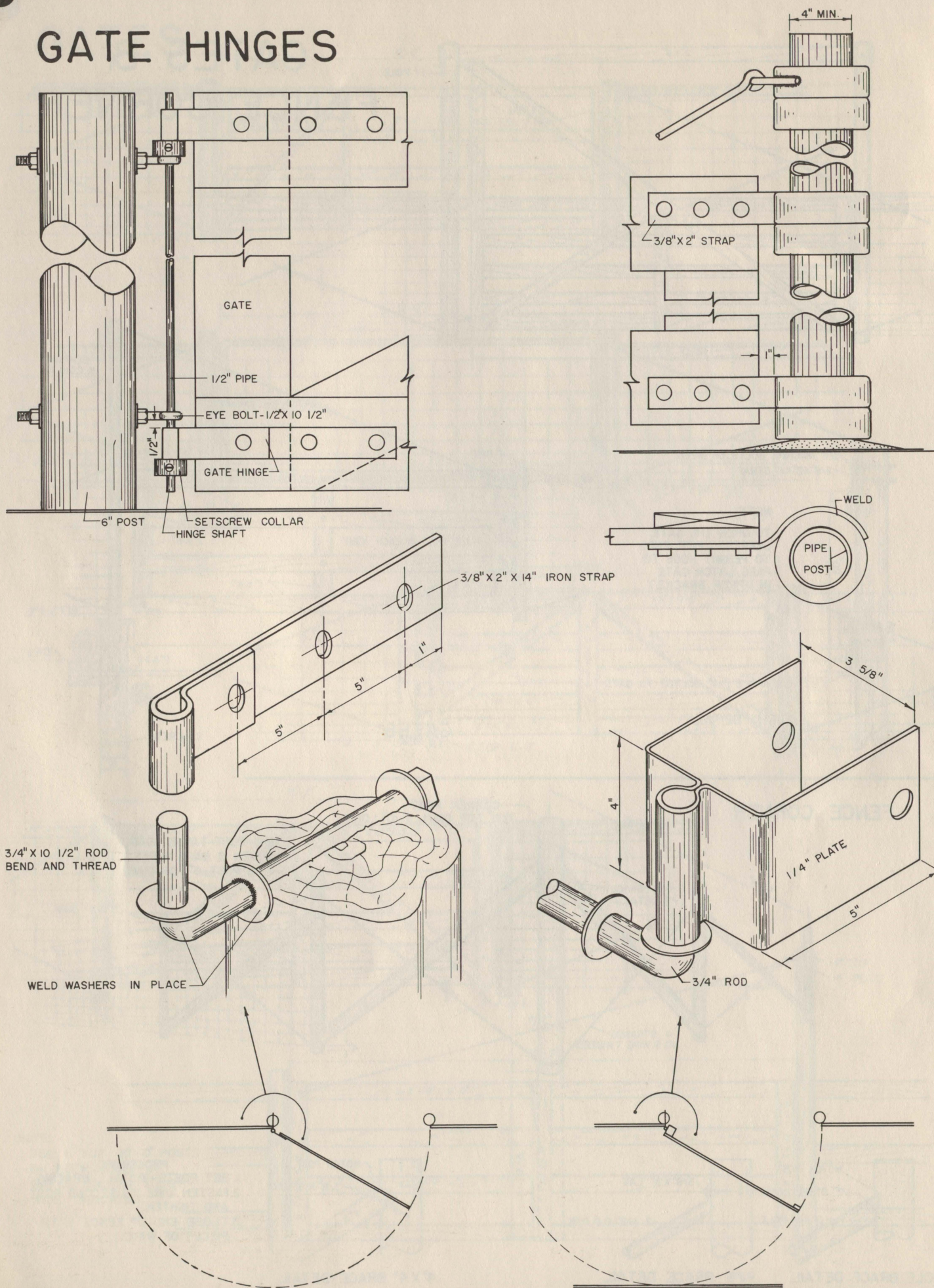
1. SET POSTS-INSTALL BRACING
2. FASTEN WIRE TO SECOND POST AND TIGHTEN.
3. CLOSE END OF FENCE WITH PIECES OF WIRE.

POLE BRACE DETAIL

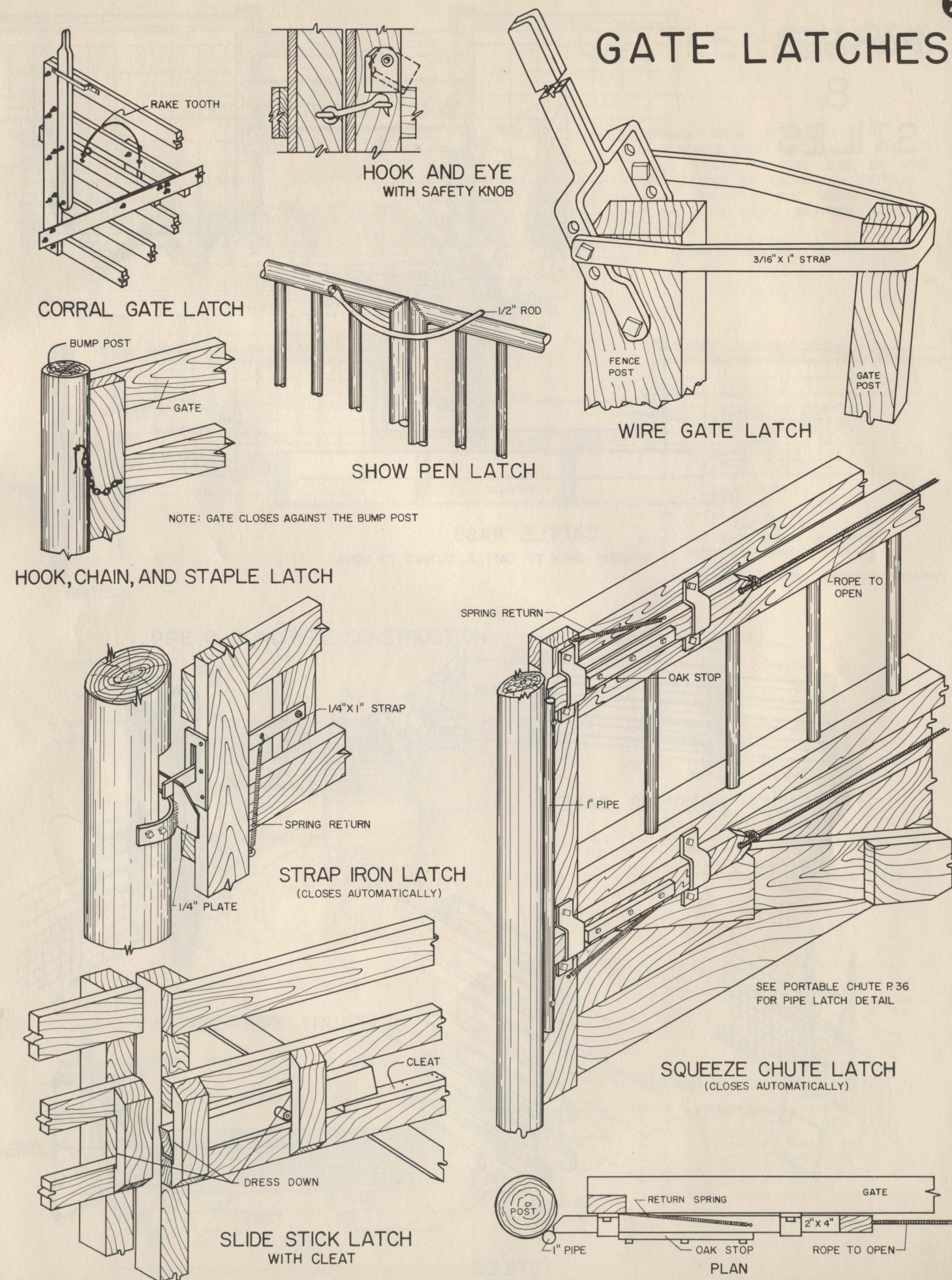
PIPE BRACE DETAIL

4" X 4" BRACE DETAIL

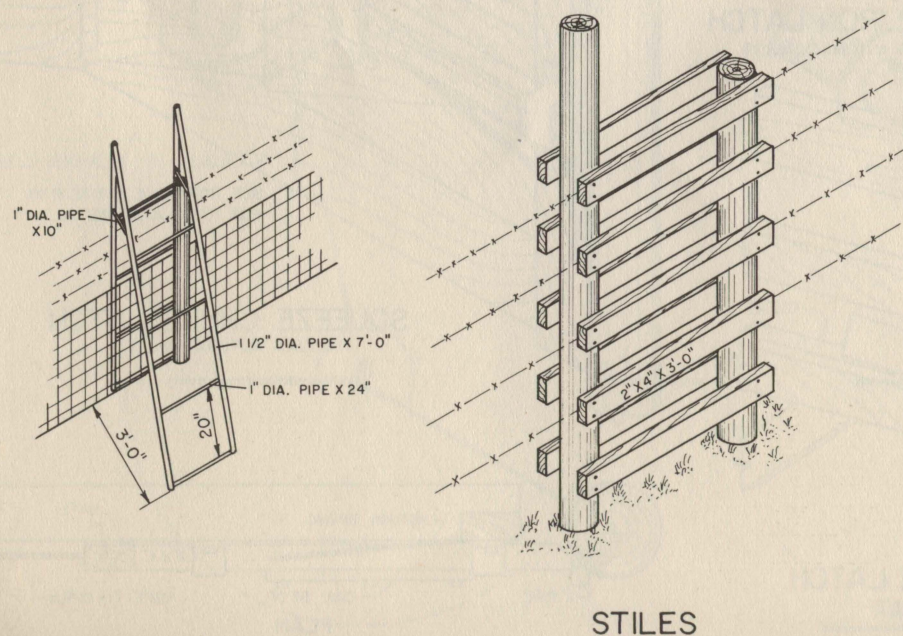
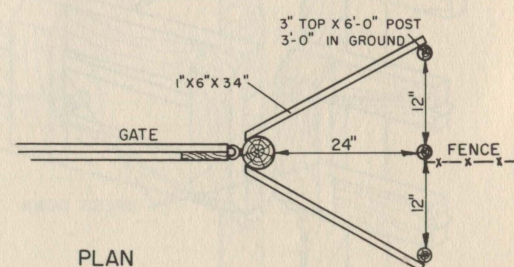
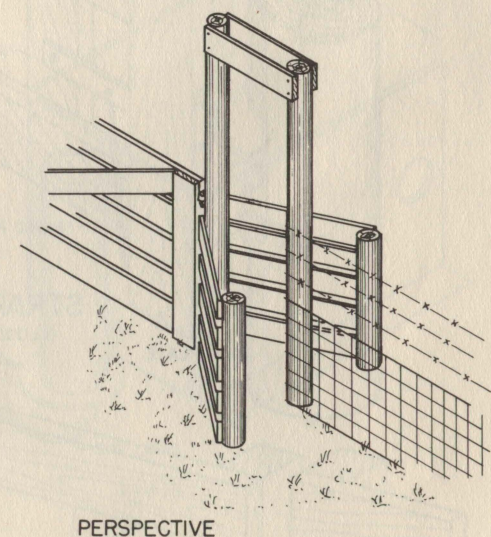
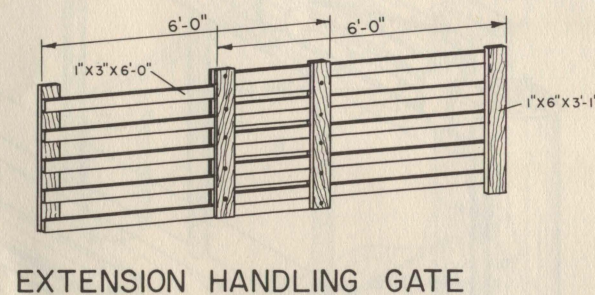
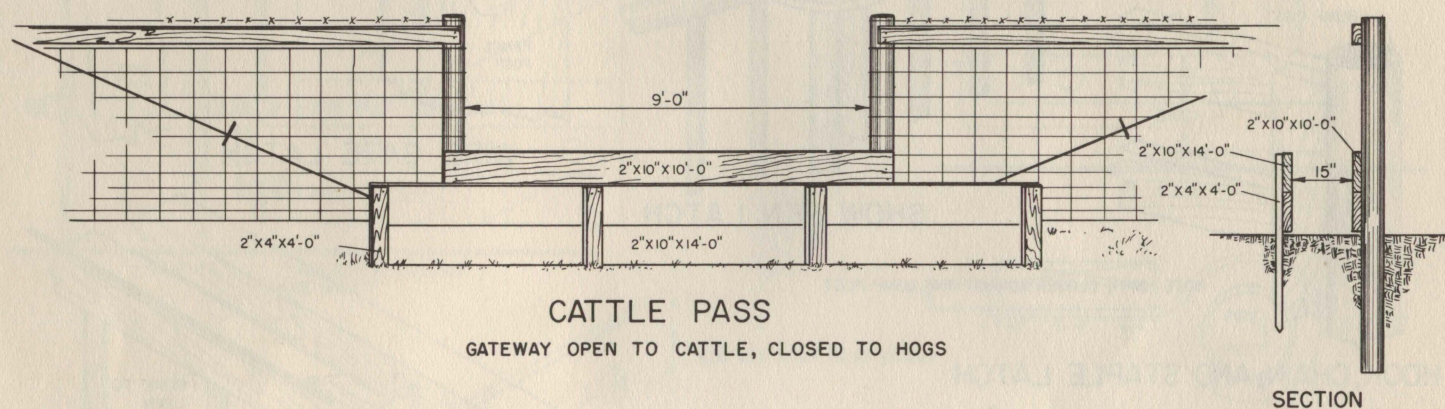
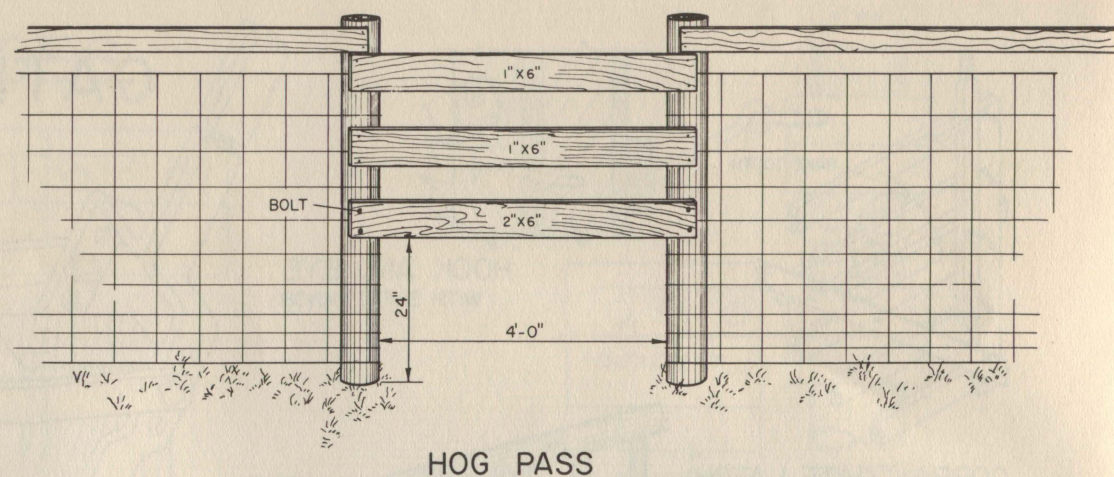
GATE HINGES



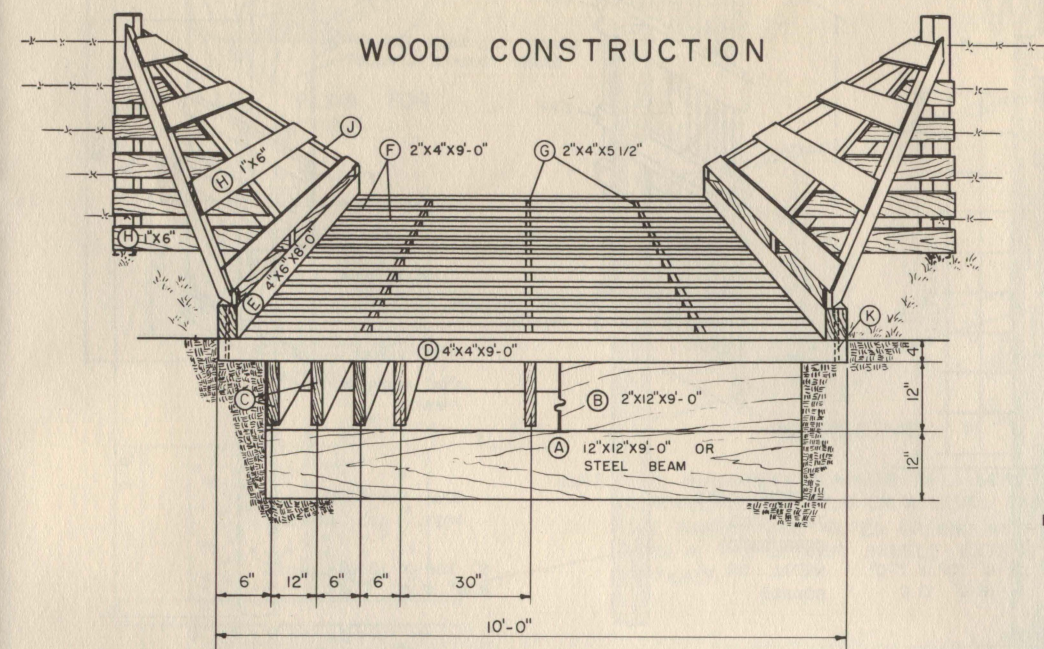
GATE LATCHES



PASSES & STILES



CATTLE GUARDS

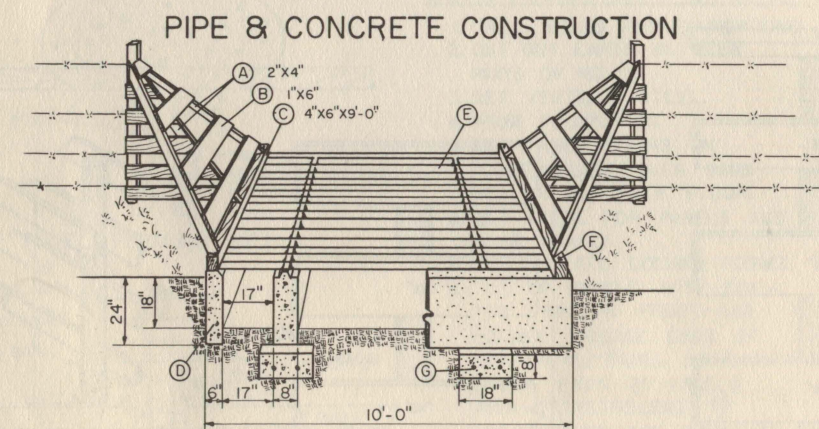


MINIMUM WIDTH OF GUARDS 5'-0".
RECOMMENDED WIDTH OF GUARDS 8'-0".
PROVIDE GATE TO ONE SIDE OF GUARD
FOR PASSAGE OF CATTLE & EXTRA
HEAVY TRUCKS & WIDE MACHINERY.
ALLOW 5 1/2" SPACE BETWEEN FLOOR
MEMBERS.

ALL LUMBER PRESSURE-TREATED.

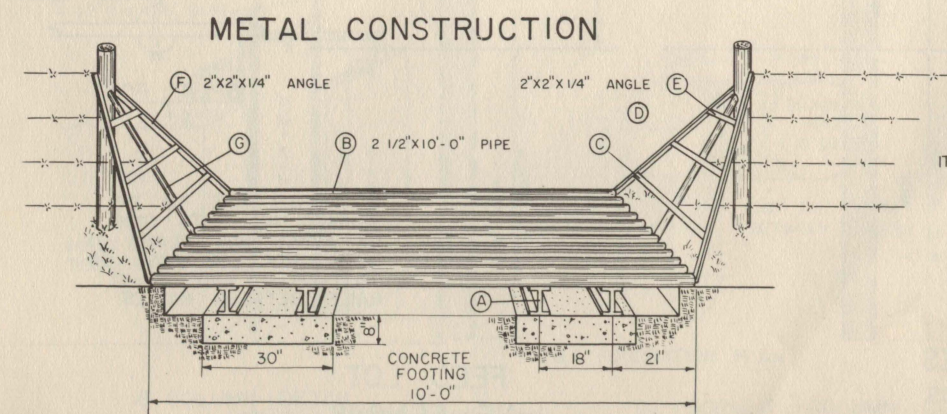
CUTTING LIST

ITEM NO.	DESCRIPTION
A 2	12"x12"x9'-0" MUD SILL OR STEEL I BEAM
B 2	2"x12"x9'-0" HEADER
C 9	2"x12"x8'-0" STRINGERS
D 2	4"x4"x9'-0" FLOOR EDGE
E 2	4"x6"x8'-0" CURB
F 12	2"x4"x9'-0" GUARD FLOOR
G 39	2"x4"x5 1/2" BLOCKS
H 70	LN. FT. 1"x6" SLATS
J 4	2"x4"x10'-0" BRACES & HIPS
K 4	3/8"x10" CARRIAGE BOLTS
I	2"x12"x8'-0" BRIDGING BETWEEN STRINGERS



CUTTING LIST

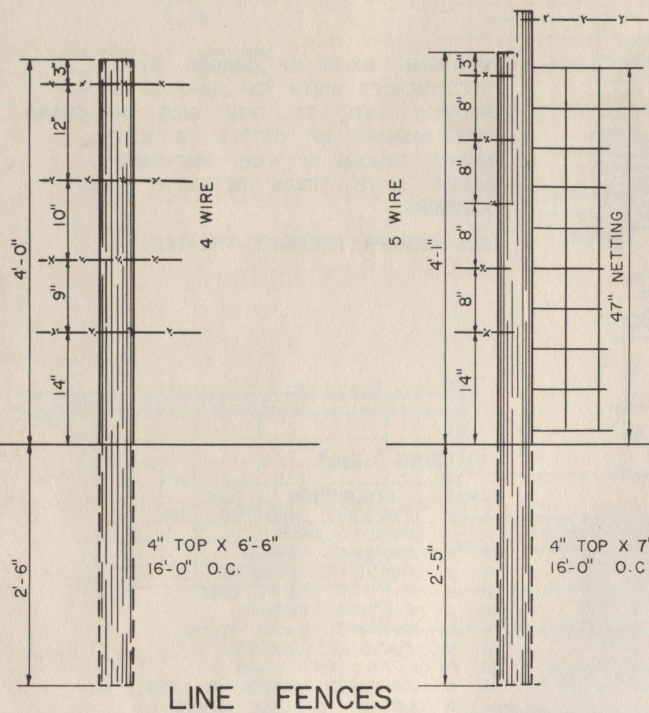
ITEM NO.	DESCRIPTION
A 1	2"x4"x12'-0" FRAMING
B 2	2"x4"x14'-0" FRAMING
C 6	1"x6"x12'-0" SLATS
D 2	4"x6"x9'-0" GUARD RAIL
E 14	3/4 CU. YDS. CONCRETE
F 14	2" NOM. DIA. GALVANIZED STEEL PIPE
G 6	1/2"x16" ANCHOR BOLTS
H 4	1/2"x9'-0" LONG REINFORCING RODS



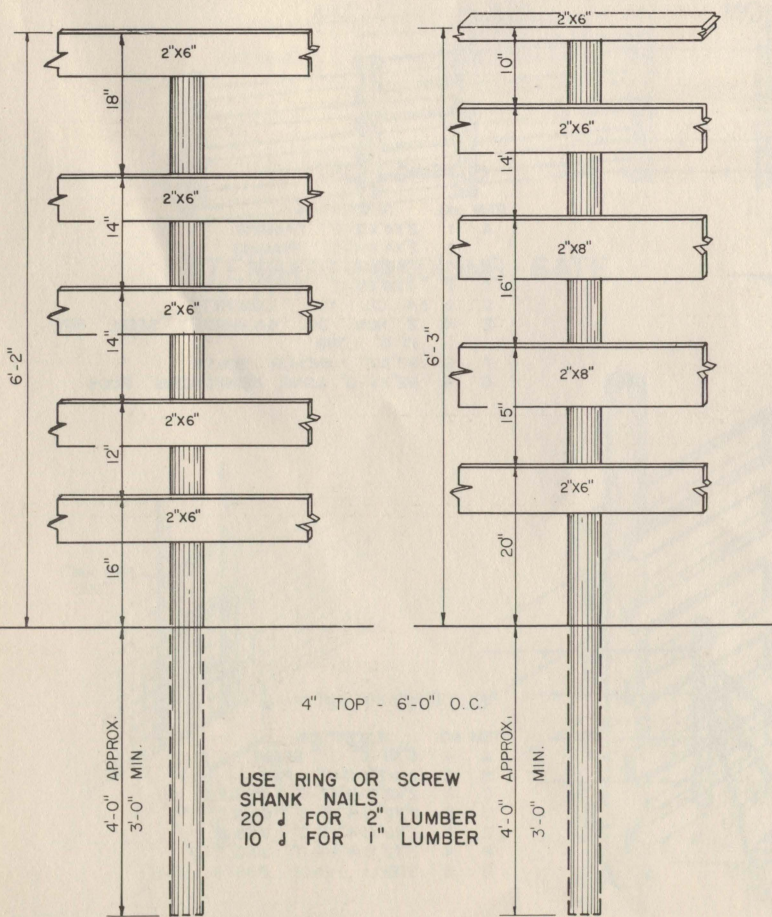
CUTTING LIST

ITEM NO.	DESCRIPTION
A 4	6"x8'-0" I BEAM
B 12	2 1/2"x10'-0" PIPE
C 2	2"x2"x1/4"x7'-0" ANGLE
D 2	2"x2"x1/4"x5'-0" ANGLE
E 2	2"x2"x1/4"x3'-0" ANGLE
F 4	2"x2"x1/4"x6'-0" ANGLE
G 2	STEEL FENCE POSTS 5'-0"

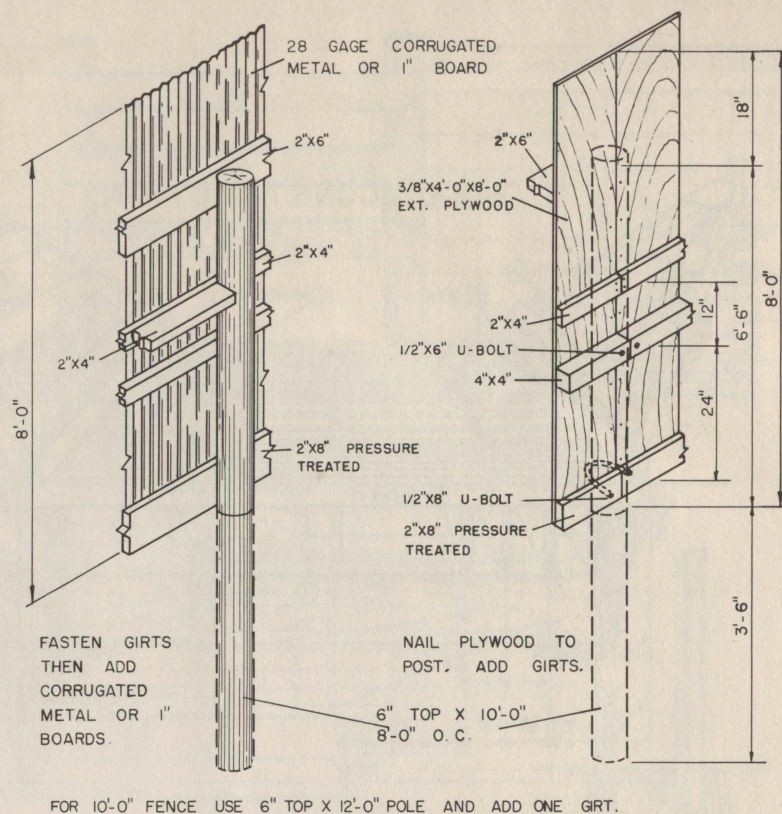
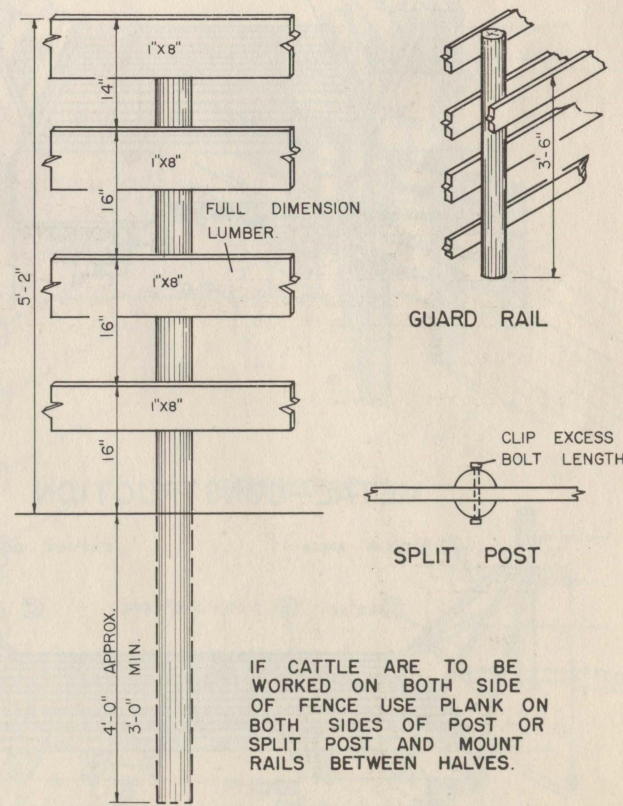
FENCES



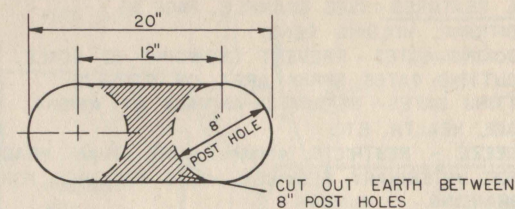
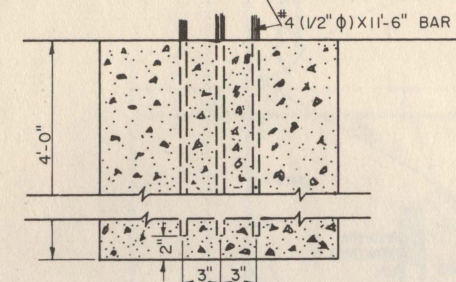
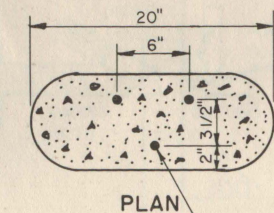
LINE FENCES



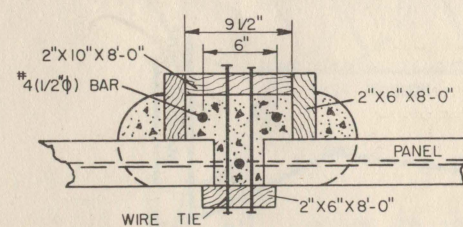
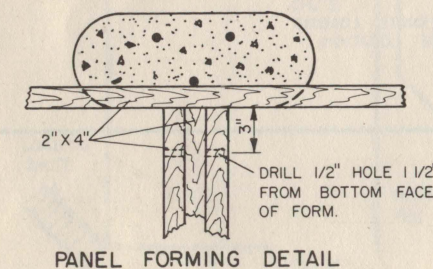
USE RING OR SCREW SHANK NAILS
20 J FOR 2" LUMBER
10 J FOR 1" LUMBER

WORKING FENCES
CORRAL, Paddock, YARDSSOLID FENCE
WIND BREAKSFEED LOT
LINE FENCES

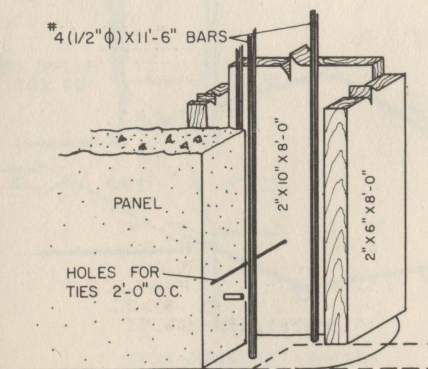
TILT-UP CONCRETE WINDBREAK

1&2 PLAN FOR
FOOTING

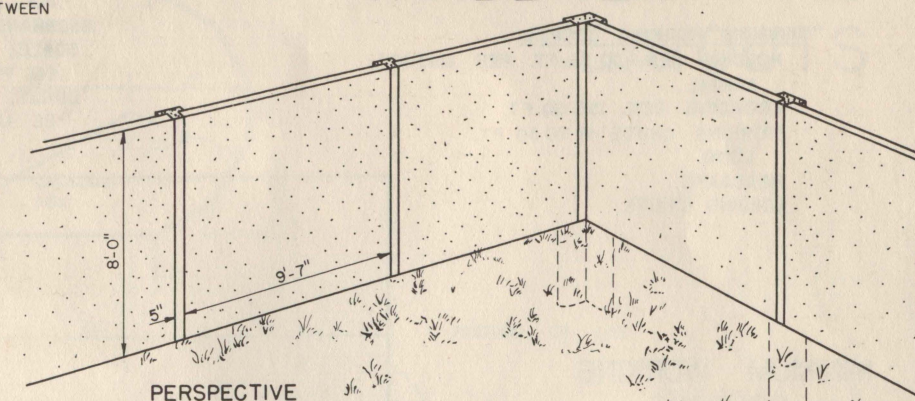
3 & 4 ELEVATION



7 & 9 COLUMN FORMING PLAN

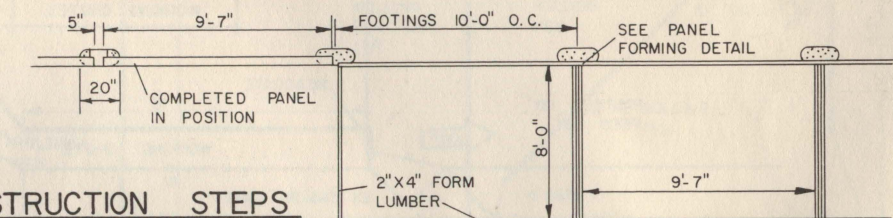


8' COLUMN DETAIL



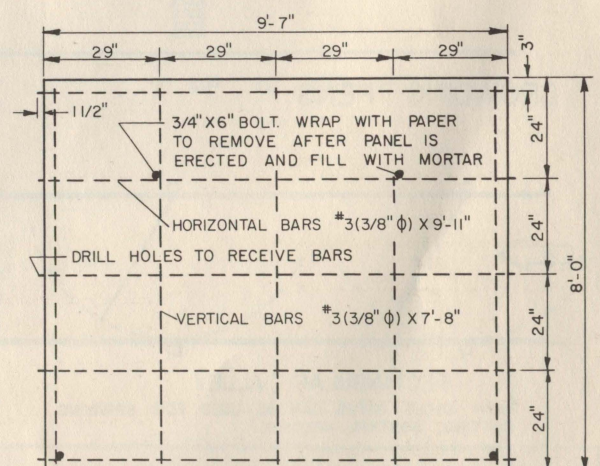
PERSPECTIVE

NOTE: THIS WINDBREAK CONSISTS OF A SERIES OF REINFORCED CONCRETE PANELS CAST OVER A POLYETHYLENE FILM ON A LEVEL SAND BED OR CONCRETE FLOOR IN 2" X 4" FORMS. THE PANELS ARE TILTED UP AND ANCHORED OVER THE FOUNDATIONS. THE HORIZONTAL BARS IN THE UPRIGHT PANELS EXTEND 1 1/2' INTO THE COLUMNS WHICH ARE CAST IN PLACE.

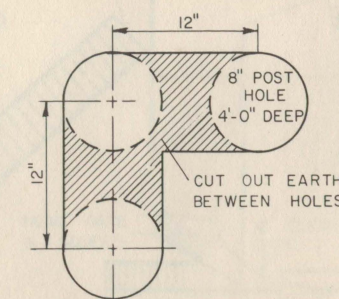


CONSTRUCTION STEPS

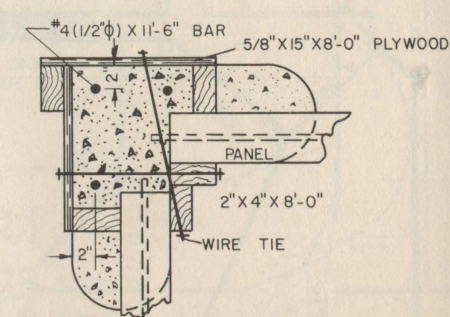
1. DRILL HOLES FOR FOUNDATIONS.
2. CUT OUT EARTH BETWEEN PAIRS OF HOLES.
3. SET VERTICAL STEEL.
4. POUR FOUNDATION.
5. SET PANEL FORMS ON POLYETHYLENE OVER SAND BED OR CONCRETE FLOOR.
6. SET STEEL FOR PANELS AND POUR PANELS.
7. PREFABRICATE COLUMN FORMS.
8. TILT UP PANELS WITH ONE-TON TRACTOR FRONT-END LOADER. GREASE ENDS OF HORIZONTAL PANEL BARS AND COVER ENDS OF PANELS WITH POLYETHYLENE TO PREVENT COLUMN CONCRETE FROM BONDING WITH PANELS.
9. INSTALL COLUMN FORMS AND POUR COLUMNS.



7 & 9 CORNER FORMING PLAN



1 & 2 FOUNDATION PLAN



CORNER COLUMN CONSTRUCTION

WITHDRAWN
DISPOSABLES, IOWA

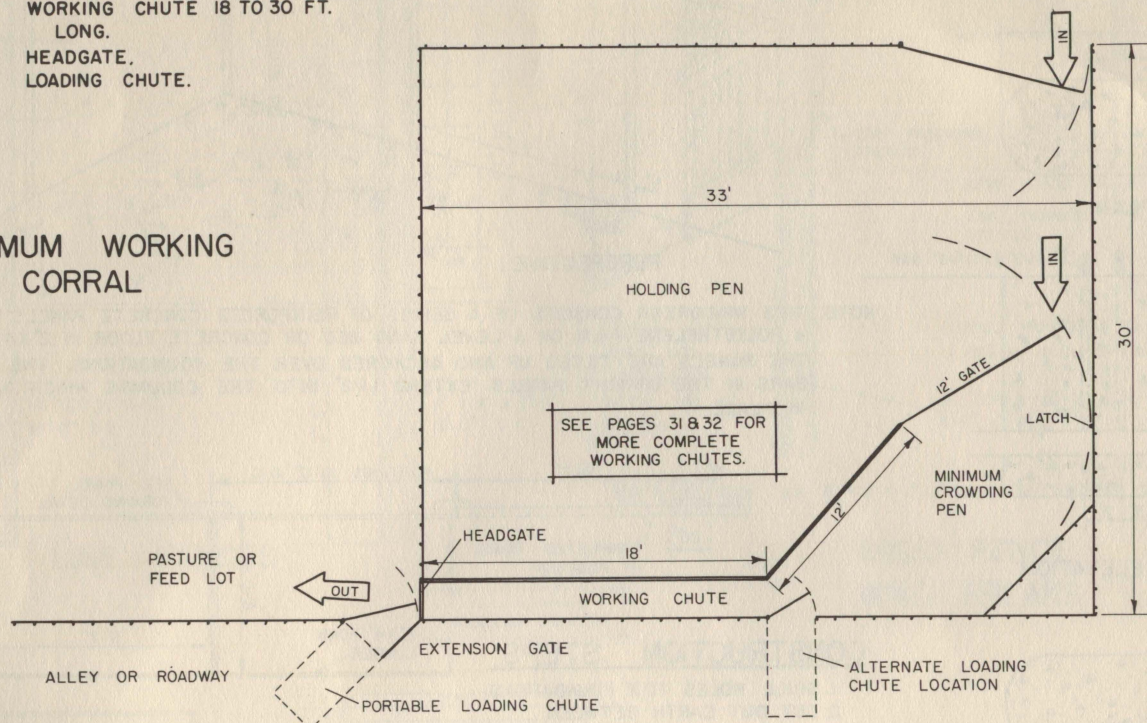
WORKING CORRALS

REFER TO INDEX FOR CONSTRUCTION DETAILS OF CORRAL EQUIPMENT

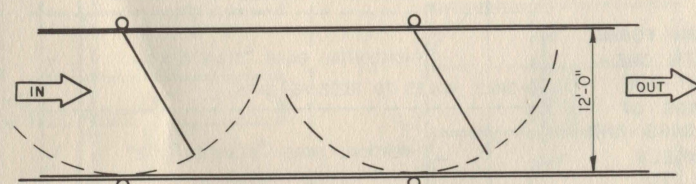
MINIMUM WORKING CORRAL

HOLDING PEN, 30 SQ. FT. PER MATURE ANIMAL.
CROWDING PEN, 150 SQ. FT.
WORKING CHUTE 18 TO 30 FT. LONG.
HEADGATE.
LOADING CHUTE.

MINIMUM WORKING CORRAL

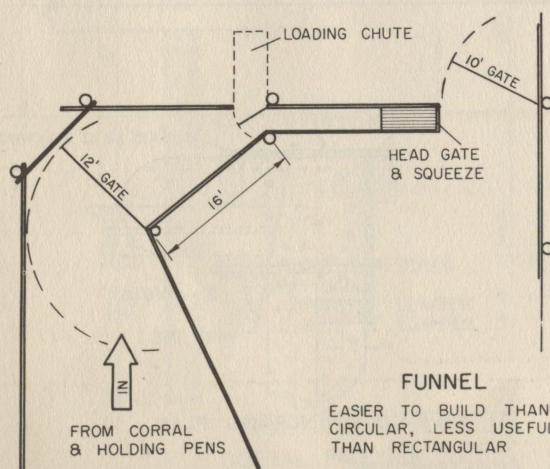


CROWDING PENS



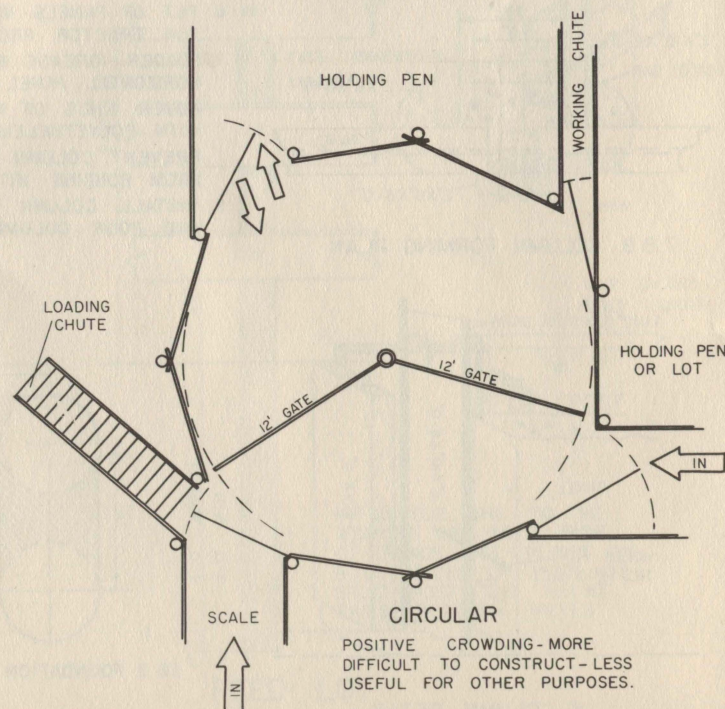
RECTANGULAR ALLEY

WITH CROSS GATES, CAN BE USED FOR SPRAYING, CUTTING, SORTING, HOLDING.



FUNNEL

EASIER TO BUILD THAN CIRCULAR, LESS USEFUL THAN RECTANGULAR



CIRCULAR

POSITIVE CROWDING - MORE DIFFICULT TO CONSTRUCT - LESS USEFUL FOR OTHER PURPOSES.

USEFUL FEATURES - (SEE EXAMPLE, PAGE 31)

ADDITIONAL HOLDING PENS.

BLOCKING GATES - PREVENT CROWDING AT SCALE, CUTTING GATES, SPRAY AREA, OR SQUEEZE.

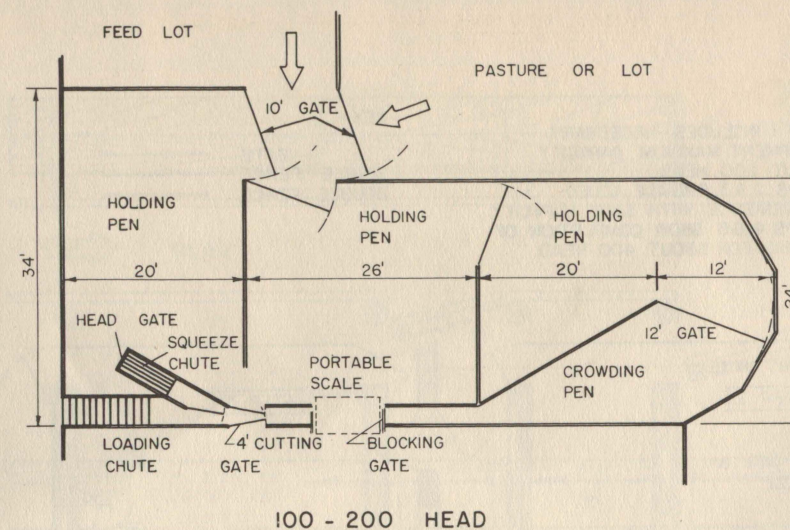
CUTTING GATES - SEPARATE ANIMALS BY WEIGHT, AGE, HEALTH, ETC.

SQUEEZE - RESTRICTS ANIMAL MORE THAN HEAD GATE, FOR VETERINARY SERVICES, ALSO REQUIRED FOR BRANDING.

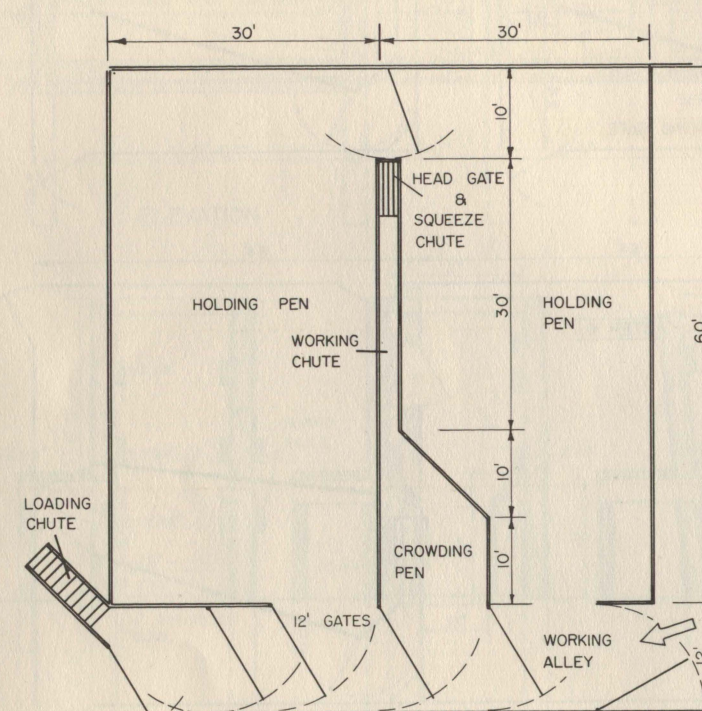
SCALE, EITHER LARGE PLATFORM FOR TRUCK OR STOCK, OR PORTABLE, FOR USE IN WORKING CHUTE.

SPRAY PEN, 8'x30' FOR 1 CARLOAD; CROWDING PEN MAY BE USED.

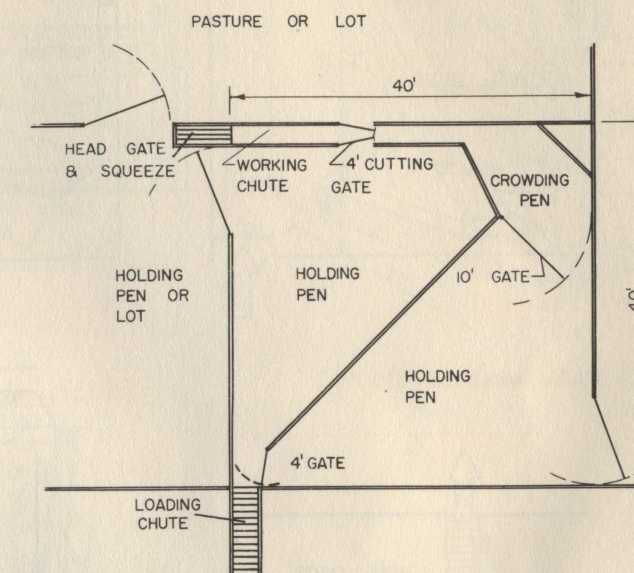
WORKING CORRAL LAYOUTS



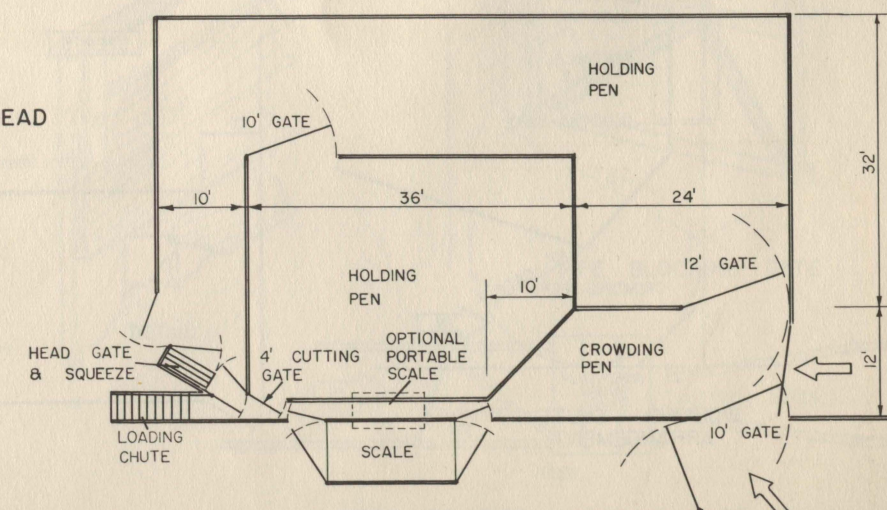
100 - 200 HEAD



UP TO 200 HEAD



UP TO 100 HEAD



UP TO 200 HEAD

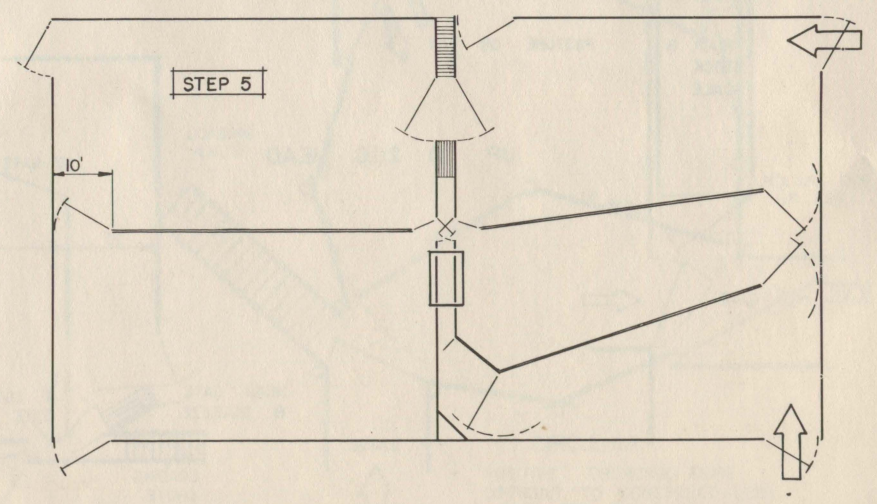
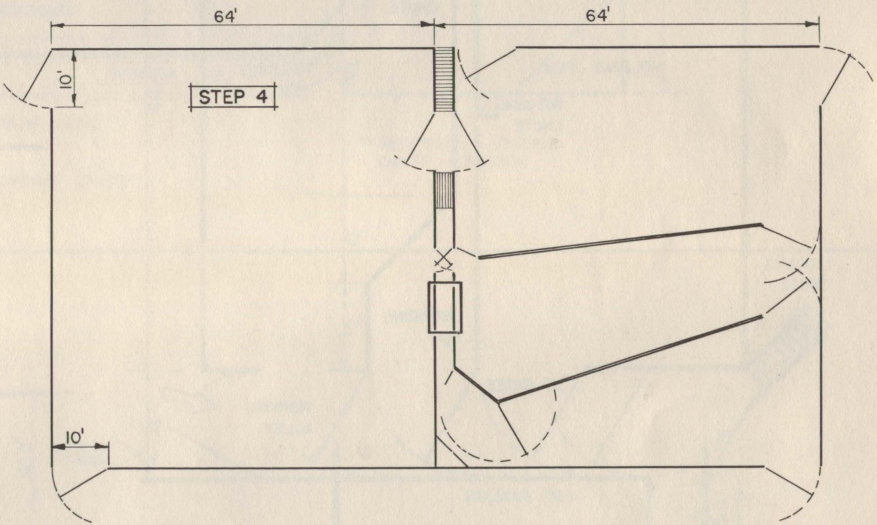
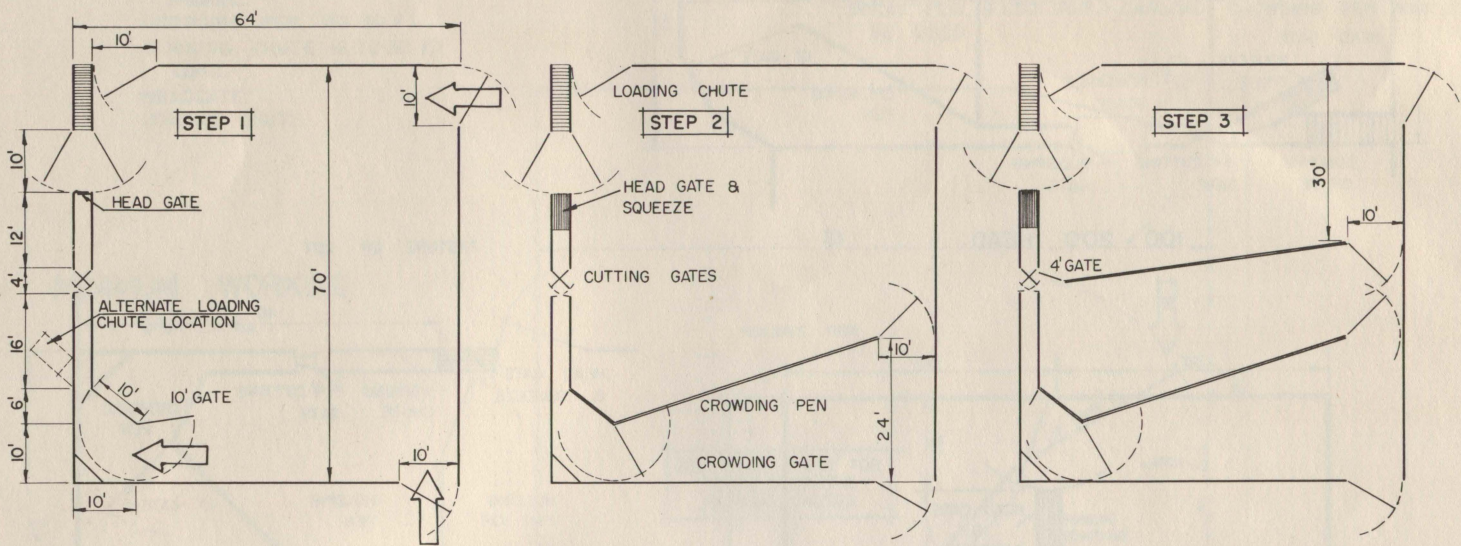
EXPANSIBLE CORRAL

NOTE:

- 1. STEP 1 INCLUDES NECESSARY EQUIPMENT. MAXIMUM CAPACITY ABOUT 200 HEAD.
- 2. STEPS 2 & 3 PROVIDE ADDED CONVENIENCE WITH SAME CAPACITY.
- 3. STEPS 4 & 5 SHOW COMPLETION OF CORRAL FOR ABOUT 400 HEAD.

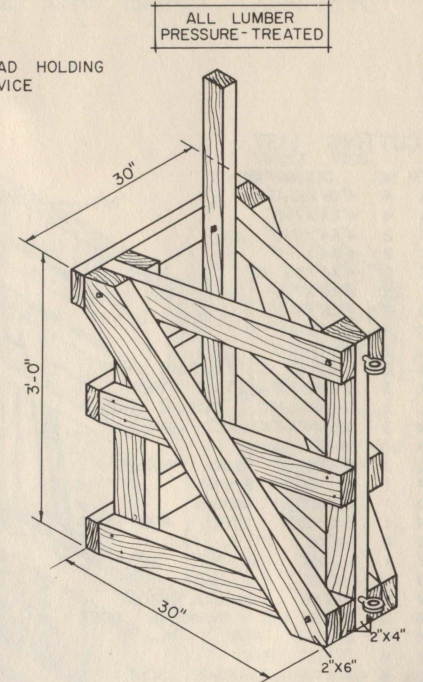
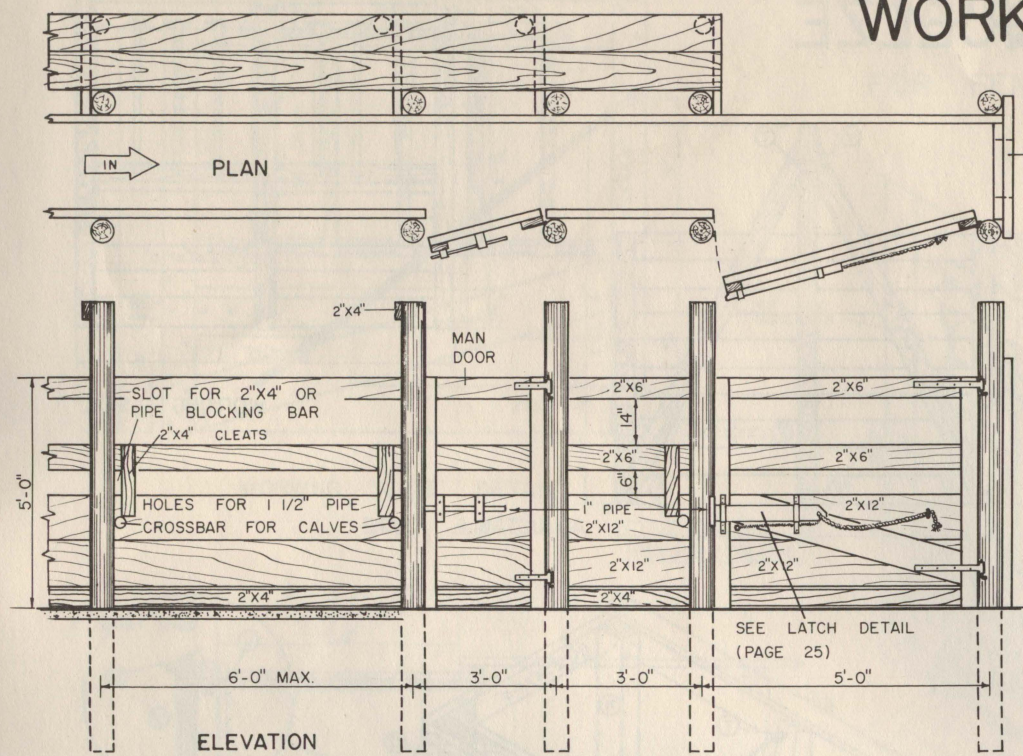
-KEY-

GATE
SINGLE FENCE
DOUBLE FENCE

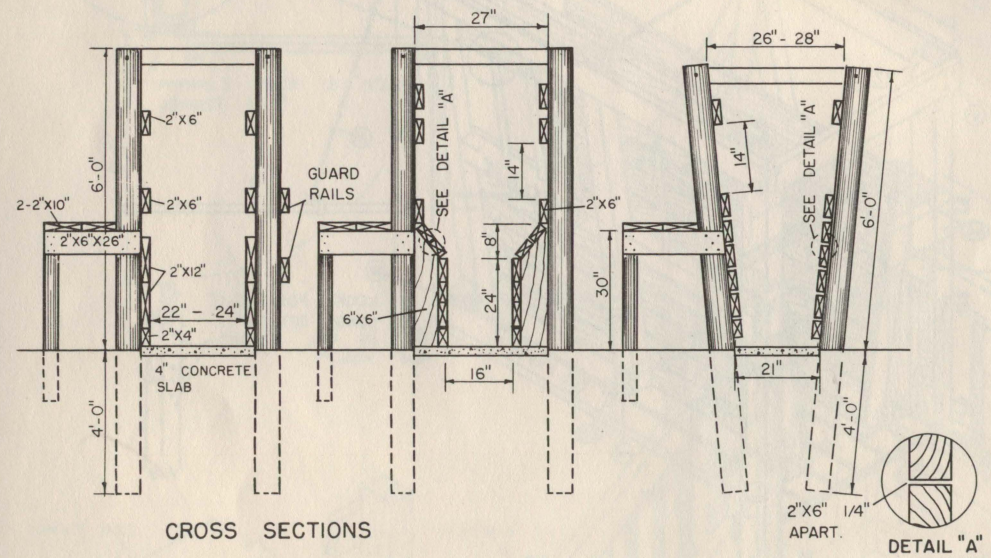


WORKING CHUTE ARRANGEMENT

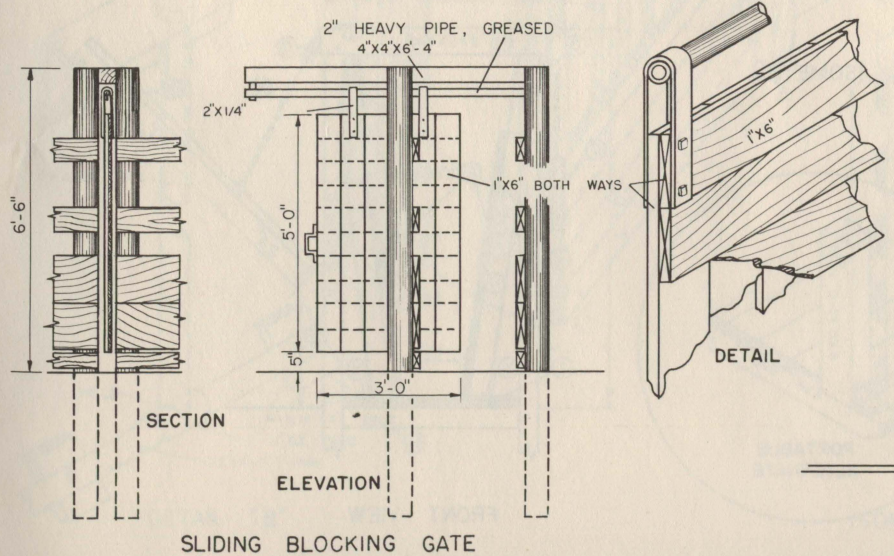
WORKING CHUTES



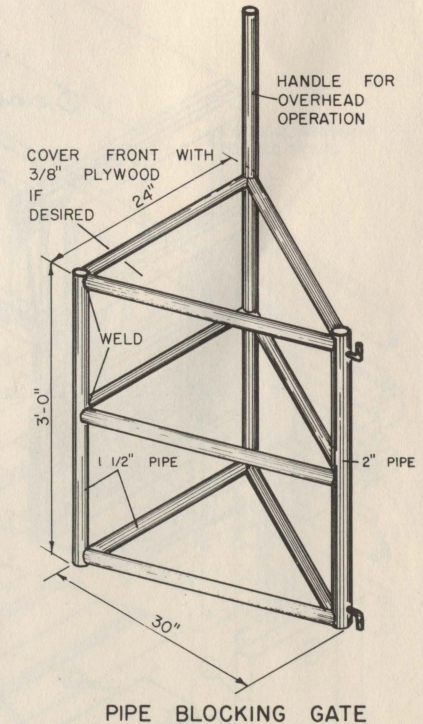
WOOD BLOCKING GATE



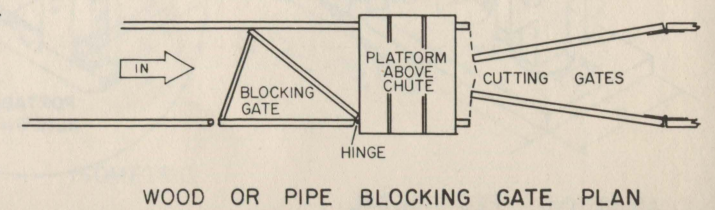
CROSS SECTIONS



SLIDING BLOCKING GATE



PIPE BLOCKING GATE

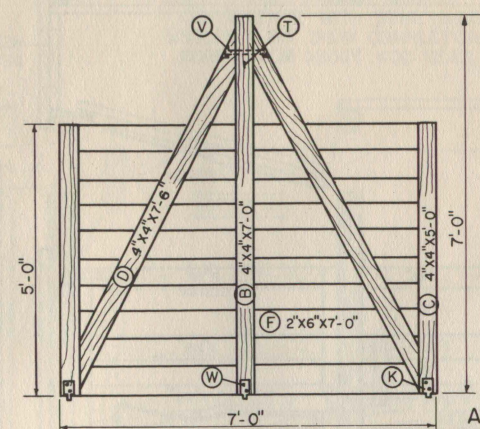


WOOD OR PIPE BLOCKING GATE PLAN

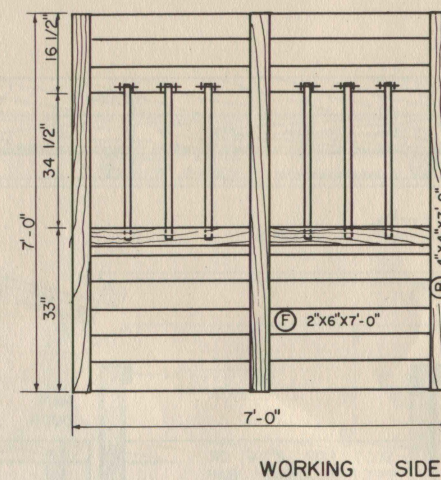
CATTLE SQUEEZE

CUTTING LIST

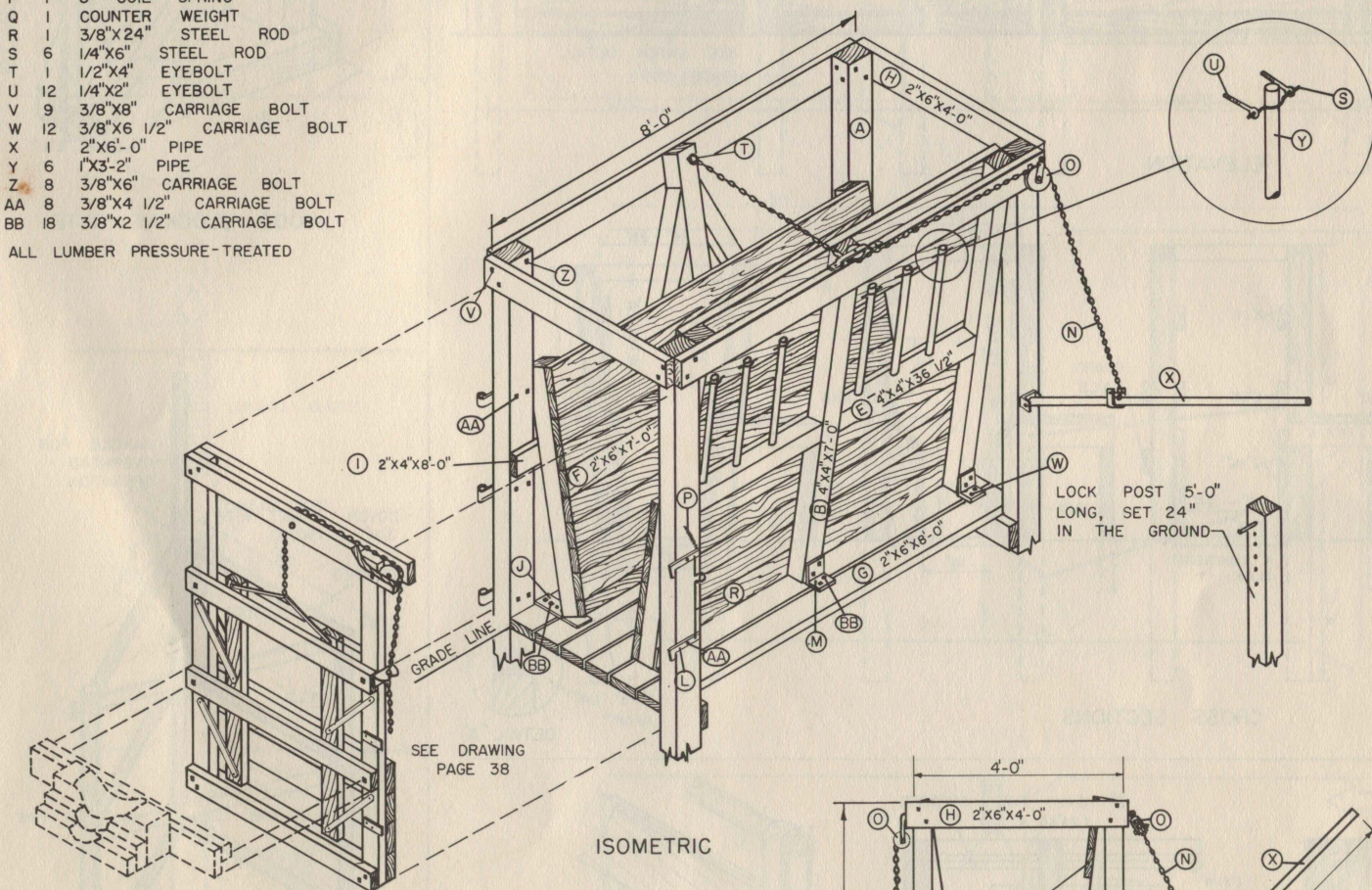
ITEM NO.	DESCRIPTION
A 4	4"x6"x10'-0"
B 4	4"x4"x7'-0"
C 2	4"x4"x5'-0"
D 2	4"x4"x7'-6"
E 2	4"x4"x36 1/2"
F 20	2"x6"x7'-0"
G 8	2"x6"x8'-0"
H 4	2"x6"x4'-0"
I 1	2"x4"x8'-0"
J 3	3/8"x3"x18" STRAP IRON
K 3	3/8"x2"x5" STRAP IRON
L 1	1/4"x1"x24" STRAP IRON
M 3	3/8"x4"x4"x3 1/2" ANGLE
N	16'-0" CHAIN
O 3	3" TO 5" CHAIN PULLEY
P 1	8" COIL SPRING
Q 1	COUNTER WEIGHT
R 1	3/8"x24" STEEL ROD
S 6	1/4"x6" STEEL ROD
T 1	1/2"x4" EYEBOLT
U 12	1/4"x2" EYEBOLT
V 9	3/8"x8" CARRIAGE BOLT
W 12	3/8"x6 1/2" CARRIAGE BOLT
X 1	2"x6'-0" PIPE
Y 6	1"x3'-2" PIPE
Z 8	3/8"x6" CARRIAGE BOLT
AA 8	3/8"x4 1/2" CARRIAGE BOLT
BB 18	3/8"x2 1/2" CARRIAGE BOLT
ALL LUMBER PRESSURE-TREATED	



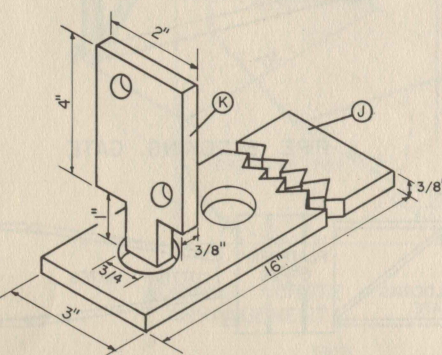
ADJUSTABLE SIDE



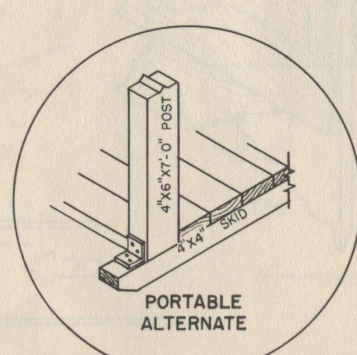
WORKING SIDE



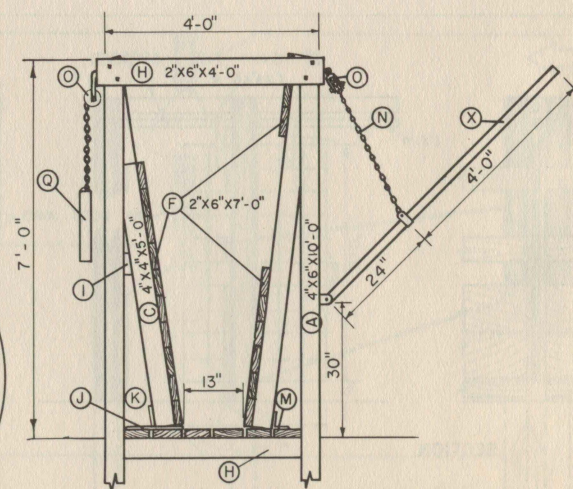
ISOMETRIC



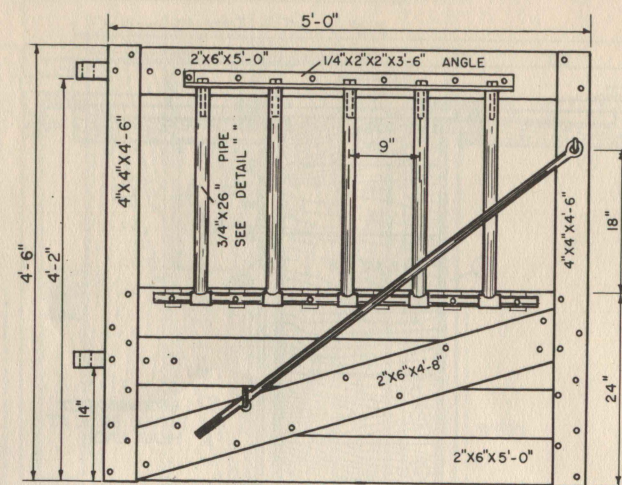
ADJUSTING PEG DETAIL



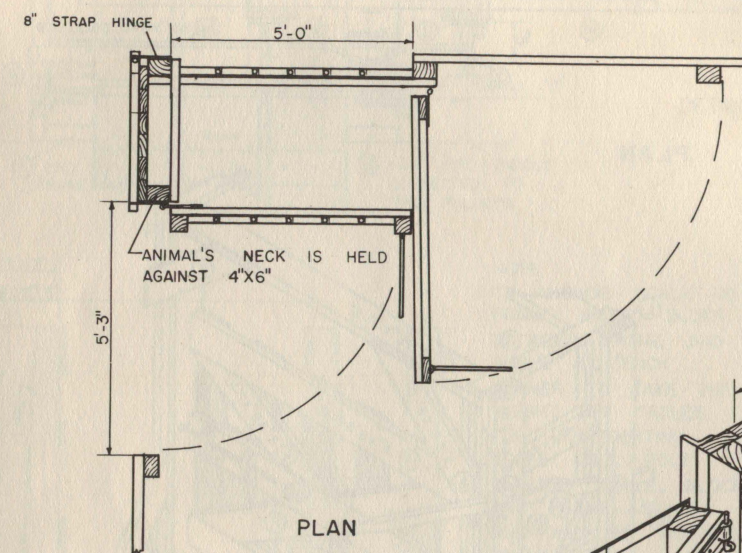
PORTABLE ALTERNATE



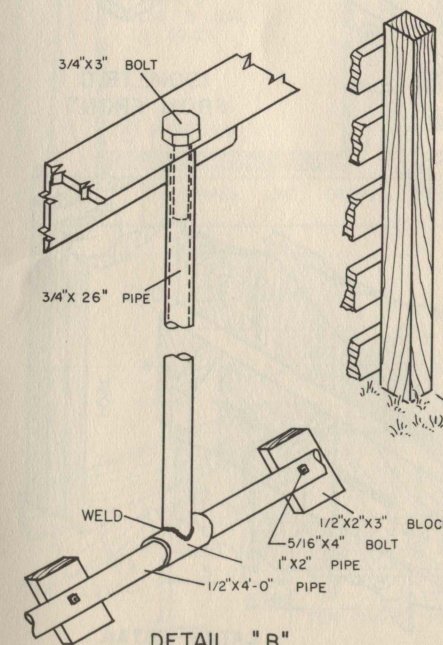
FRONT VIEW



WORKING GATE DETAIL



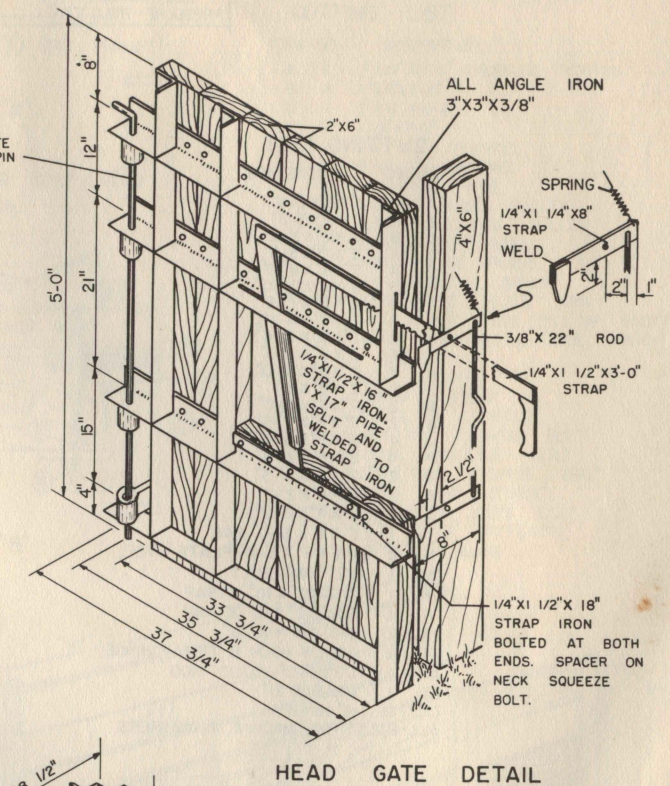
PLAN



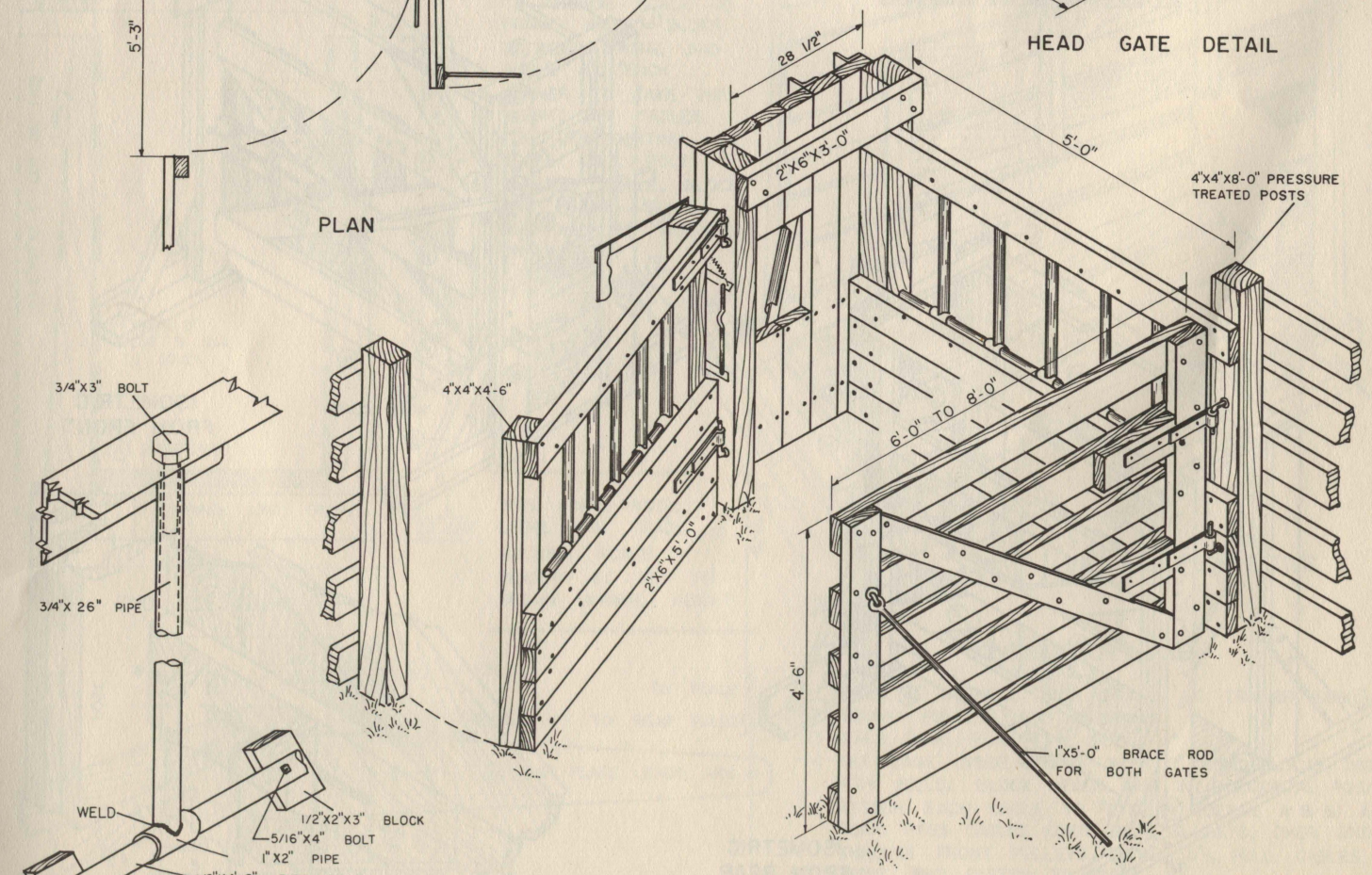
DETAIL "B"

SQUEEZE CHUTE

FOR FENCE OR BARN CORNER



HEAD GATE DETAIL



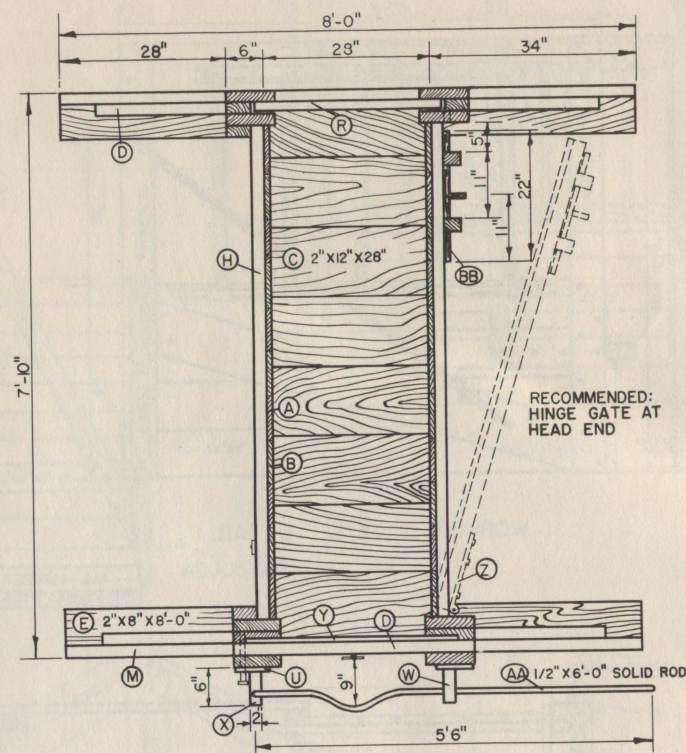
ISOMETRIC

PORTABLE CHUTE

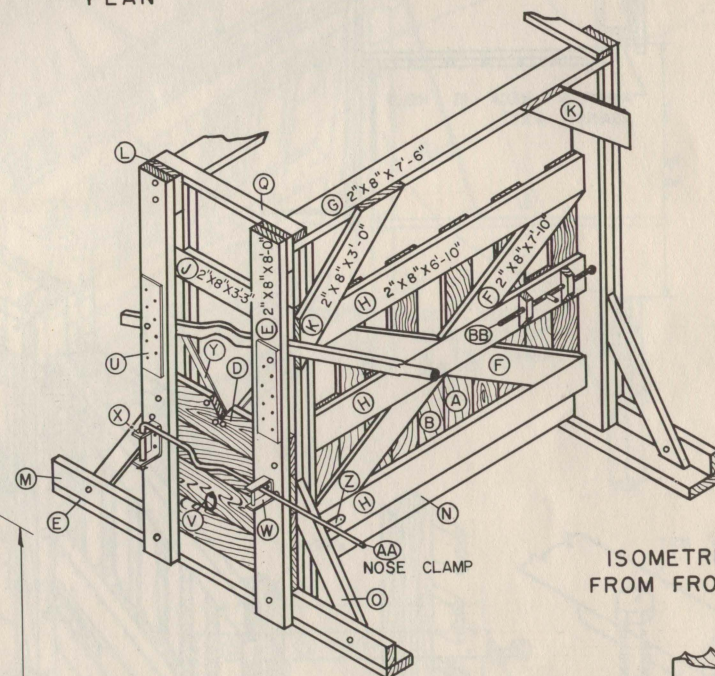
ALL LUMBER
PRESSURE-TREATED

CUTTING LIST

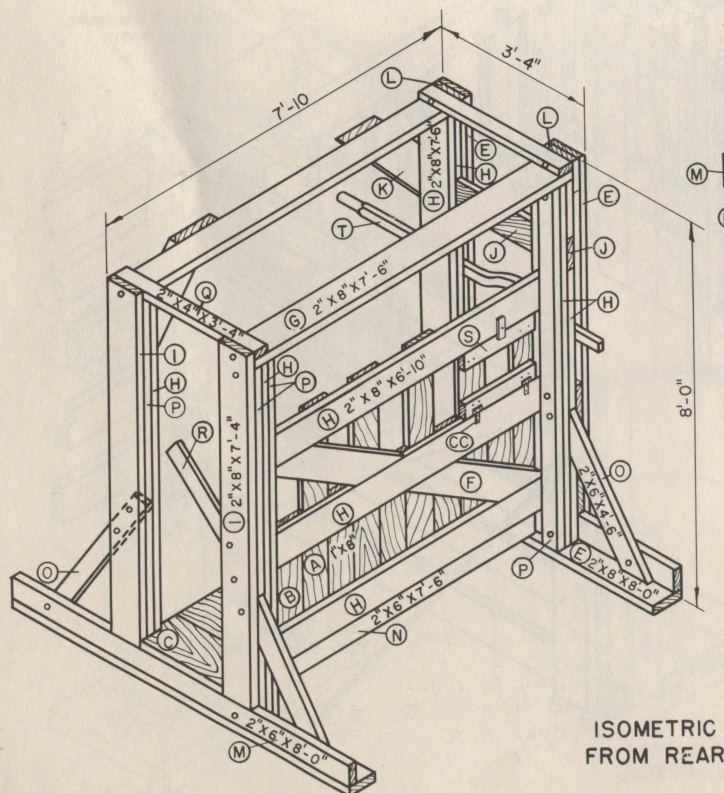
ITEM NO.	DESCRIPTION
A	12 1"X8"X5'-10"
B	12 1"X8"X3'-3"
C	2 2"X12"X2'-4"
D	2 2"X10"X3'-3"
E	2 2"X8"X8'-0"
F	2 2"X8"X7'-10"
G	2 2"X8"X7'-6"
H	2 2"X8"X6'-10"
I	2 2"X8"X7'-4"
J	2 2"X8"X3'-3"
K	2 2"X8"X8'-0"
L	2 2"X6"X8'-0"
M	2 2"X6"X7'-6"
N	2 2"X6"X4'-6"
O	2 2"X4"X7'-6"
P	2 2"X4"X3'-3"
Q	2 2"X4"X2'-7"
R	2 2"X4"X2'-0"
S	1 1"X1"X6'-0" BAR
T	2 1/4"X6"X2'-0" PLATE STEEL
U	1 1/2" RING BOLT
V	3/8"X2"X16" STRAP
W	3/8"X2"X18" STRAP
X	3/8"X2"X4'-6"
Y	2 SCREW HOOK & STRAP HINGE
Z	1 1/2"X6'-0" SOLID ROD
AA	1 1/2" ROD 21"
BB	2 4" HINGE
CC	2 4" HINGE
DD	ALL BOLTS-1/2" MACHINE & WASHERS



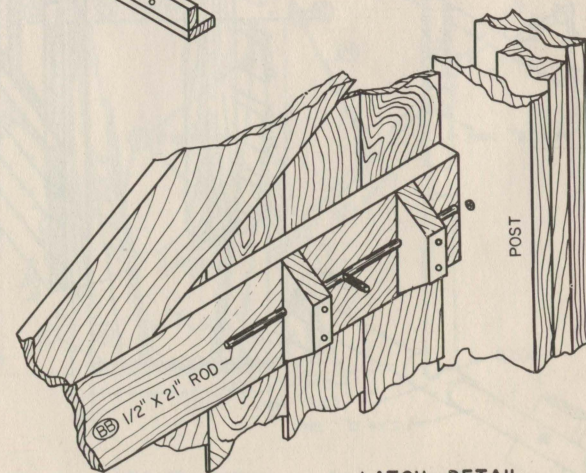
PLAN



ISOMETRIC
FROM FRONT



ISOMETRIC
FROM REAR

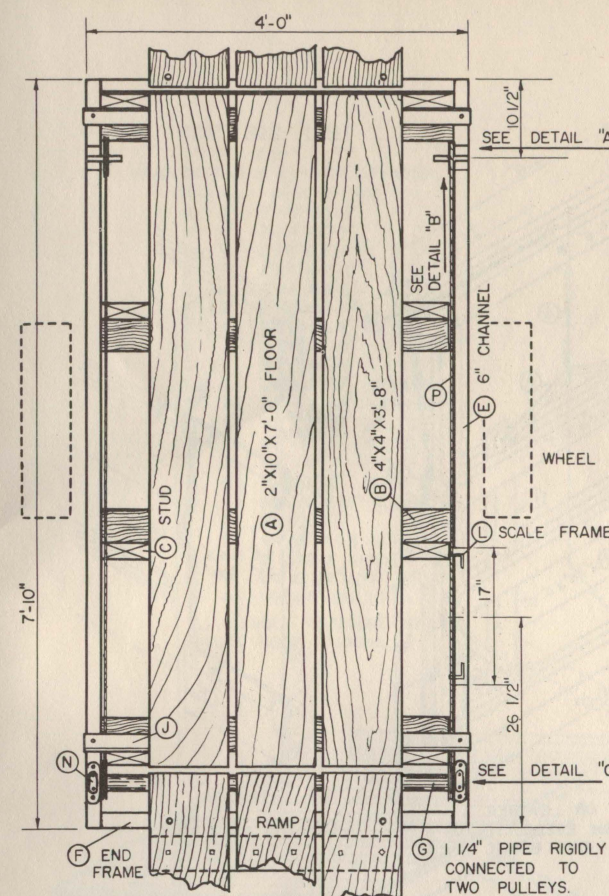


LATCH DETAIL

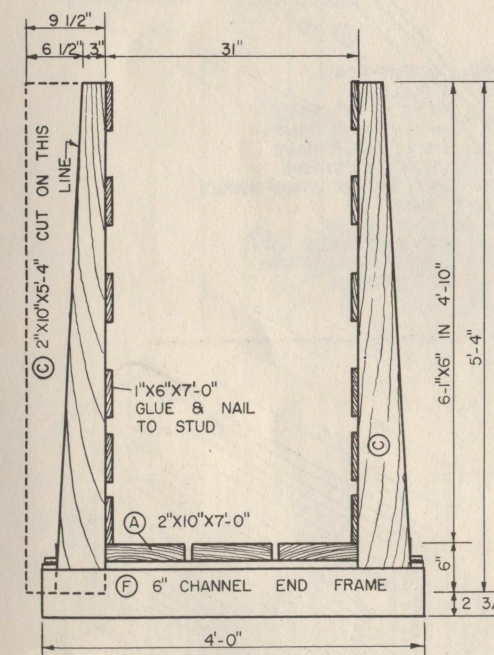
PORTABLE SCALE

CUTTING LIST

ITEM NO.	DESCRIPTION
A	3 2"X10"X7'-0" PRESSURE-TREATED
B	4 4"X4"X3'-8"
C	4 2"X10"X5'-4"
D	12 1"X6"X7'-0"
E	2 6"X7'-10" CHANNEL
F	2 6"X4'-0" CHANNEL
G	1 1/4"X3'-6" PIPE
I	2 5/8"X4" BORED PULLEY
H	2 5/8"X4" BEARING PULLEY
J	4 1/4"X2"X2"X12" ANGLE
K	4 3/8"X3"X7 1/2" PLATE
L	1 2"X2"X1/4"X5'-3" ANGLE
M	1 3/8"X5"X2'-3" PLATE ARM
N	1 5/8" SHAFT WITH PILLOW BLOCKS
O	1 150 lb OR 200 lb MAX. SPRING
P	212' 3/16" CABLE
Q	4 5/8"X4 1/2" Ø BAR
R	4 3/8"X2 1/2" EYEBOLT
S	8 1/4"X4 1/2" MACHINE BOLT
T	8 1/2"X6" MACHINE BOLT
U	8 1/2"X2 1/2" MACHINE BOLT
V	4 3/8"X1" CAP SCREW
W	4 1/4" WIRE ROPE CLIP
X	4 1/4"X1"X5 1/2" STIFFENER
Y	2 1/2"X3"X3" PLATE



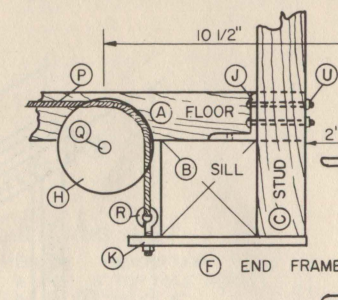
PLAN



END ELEVATION

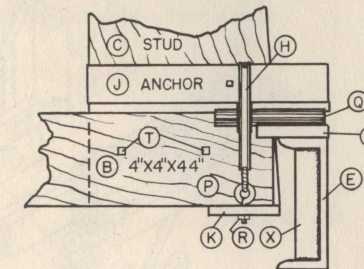
NOTE
TO ANCHOR SCALE TO
FRAME, INSERT BLOCK
BETWEEN FRAME AND
ANGLE AT EACH
CORNER TO TAKE THE
WEIGHT OFF CABLES.
FOR TRANSPORTING
SCALE UNIT, BOLT
THROUGH ANGLE, BLOCK,
AND FRAME. SCALE
UNIT MAY BE MOUNTED
ON WHEELS.

THIS SCALE NOT
LEGAL FOR TRADE.
MULTIPLY SCALE
READING BY TEN TO
OBTAIN ANIMAL WEIGHT.

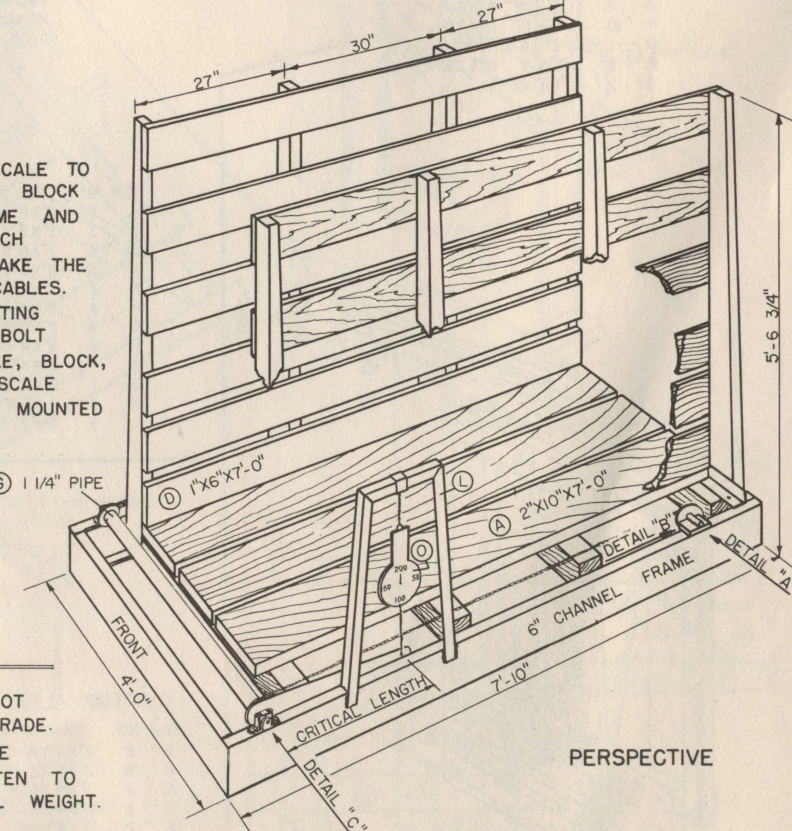


DETAIL "A"

NOTE
GLUE AND BOLT STUD TO
4"X4" SILL.



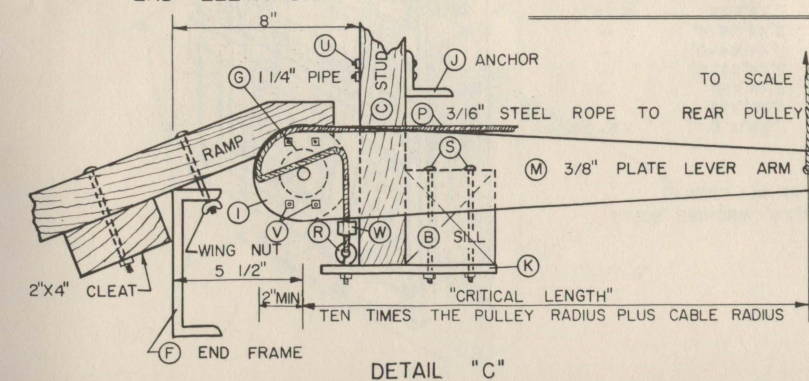
DETAIL "B"



PERSPECTIVE

CONSTRUCTION PLAN

- BUILD 6" CHANNEL IRON FRAME AS TRAILER BED.
- MOUNT PULLEYS AND BEARINGS.
- BUILD CAGE (FLOOR & SIDE).
- SET CAGE INSIDE FRAME WITH 3" HIGH BLOCKS UNDER 4"X4" SILLS. BLOCK LEVER ARM IN HORIZONTAL POSITION.
- ATTACH EACH CABLE TO "EYE" (R) (DETAIL A & B) AT REAR. PASS CABLES OVER REAR PULLEYS, OVER AND THROUGH FRONT PULLEYS (DETAIL "A"), PULL CABLES TIGHT, AND FASTEN TO "EYE".
- ATTACH SCALE AND CHECK WITH KNOWN WEIGHTS.



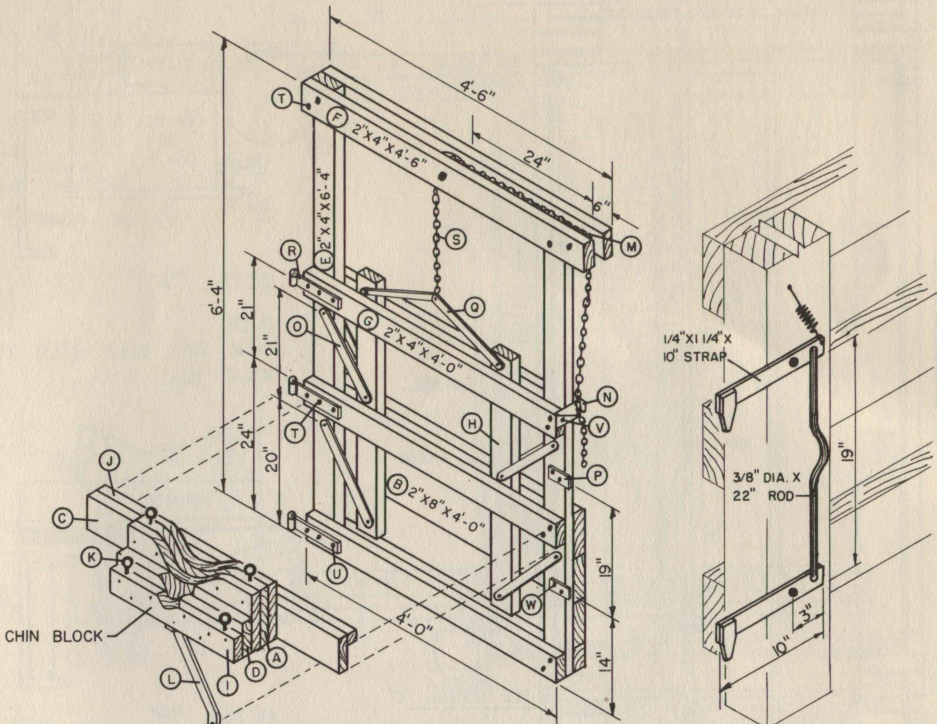
DETAIL "C"

HEAD GATES

ALL LUMBER
PRESSURE-TREATED

CUTTING LIST

ITEM NO.	DESCRIPTION
A 2	6"X6"X8'-6"
B 1	2"X12"X3'-3"
C 3	2"X10"X24"
D 2	2"X6"X5'-2"
E 1	2"X8"X3'-3"
F 1	2"X6"X6'-8"
G 3	2"X6"X3'-3"
H 1	2"X6"X24"
I 1	2"X4"X4'-0"
J 1	2"X4"X24"
K 4	3/8" EYEBOLTS
L 2	1/4"X5"X12" STRAP
M 1	1/2" PIPE
N 1	RATCHET
O 4	1/2"X12" BOLTS
P 10	1/2"X8" BOLTS
Q 1	1/2"X4 1/2" BOLT
R 5	1/2"X3" BOLTS
S 2	2"X4"X27"



PROVIDE ROPES OR LEATHER STRAPS THROUGH EYEBOLTS TO HOLD HEAD TO CHIN BLOCK.

LATCH DETAIL

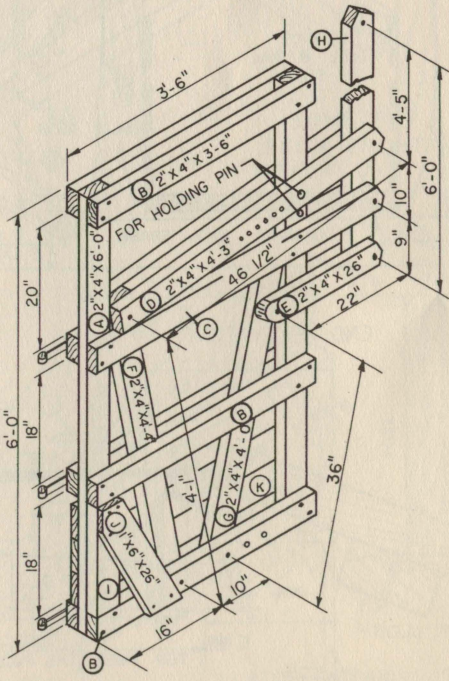
CUTTING LIST

ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION
A 3	2"X10"X24"	M 2	5" PULLEYS
B 3	2"X8"X4'-0"	N 1	1/4"X2"X3"X5" ANGLE
C 1	2"X6"X4'-0"	O 6	1/4"X1 1/2"X19" STRAPS
D 1	2"X6"X24"	P 2	3/8"X2"X6" STRAPS
E 2	2"X4"X6'-4"	Q 2	1/8"X1"X14" STRAPS
F 2	2"X4"X4'-6"	R 3	1/4"X1 3/4"X10" STRAP HINGES
G 4	2"X4"X4'-0"	S 8 FT.	CHAIN
H 2	2"X4"X3'-8"	T 16	1/2"X6" BOLTS
I 1	2"X4"X24"	U 14	1/2"X2 1/2" BOLTS
J 1	2"X2"X4'-0"	V 2	3/8"X2" LAG SCREWS
K 4	3/8" EYEBOLTS	W 4	1/2"X4" BOLTS
L 1	1/4"X1 1/2" STRAP		

CUTTING LIST

ITEM NO.	DESCRIPTION	FOR 3'-2" WIDTH
A 2	2"X4"X6'-0"	—
B 6	2"X4"X3'-6"	X3'-2"
C 2	2"X4"X4'-8"	X4'-4"
D 2	2"X4"X4'-3"	X4'-1"
E 2	2"X4"X26"	X24"
F 1	2"X4"X4'-4"	—
G 1	2"X4"X4'-0"	—
H 1	2"X4"X6'-0"	—
I 1	2"X4"X18"	—
J 1	1"X6"X26"	—
K 3	2"X6"X3'-6"	X3'-2"

BOLTS AT ALL JOINTS ARE 1/2"X6" MACHINE BOLTS

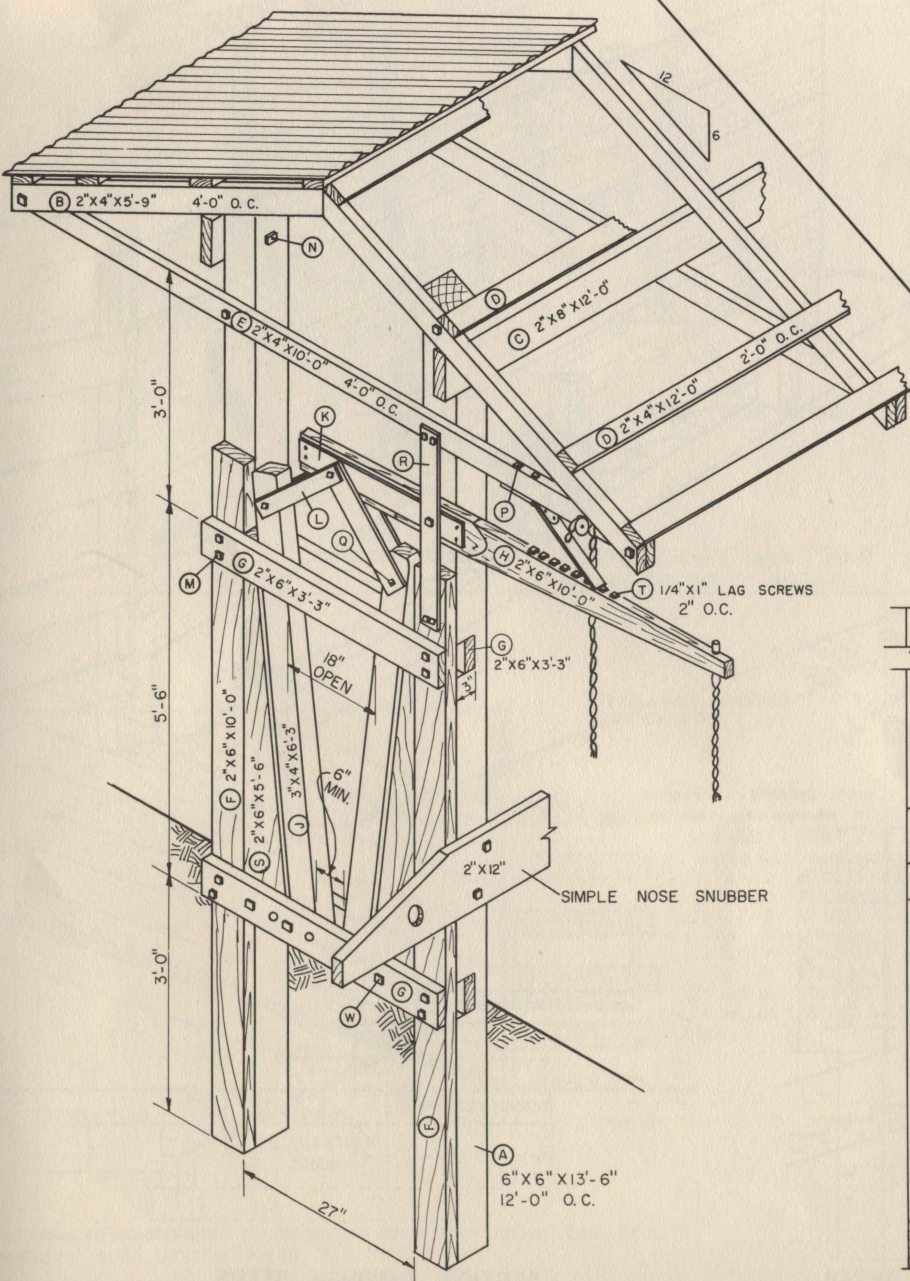


CUTTING LIST

FOR
HEAD GATE & 12' LENGTH OF ROOF

ITEM NO.	DESCRIPTION
A 2	6"X6"X13'-6"
B 8	2"X4"X5'-9"
C 2	2"X8"X12'-0"
D 8	2"X4"X12'-0"
E 4	2"X4"X10'-0"
F 2	2"X6"X10'-0"
G 4	2"X6"X3'-3"
H 1	2"X6"X7'-0"
J 2	3"X4"X6'-3"
K 2	1/8"X4"X31" STRAPS
L 4	3/8"X3"X18" STRAPS
M 8	1/2"X9 1/2" BOLTS
N 22	1/2"X8" BOLTS
P 10	1/2"X4" BOLTS
Q 4	1/2"X3 1/2" BOLTS
R 1	3/8"X2"X33" STRAP
S 2	2"X6"X5'-6"
T 8	1/4"X1" LAG SCREWS
U 1	5" STRAP HINGE
V 1	1/4"X1 1/2"X20" STRAP
W 4	1/2"X7" BOLTS

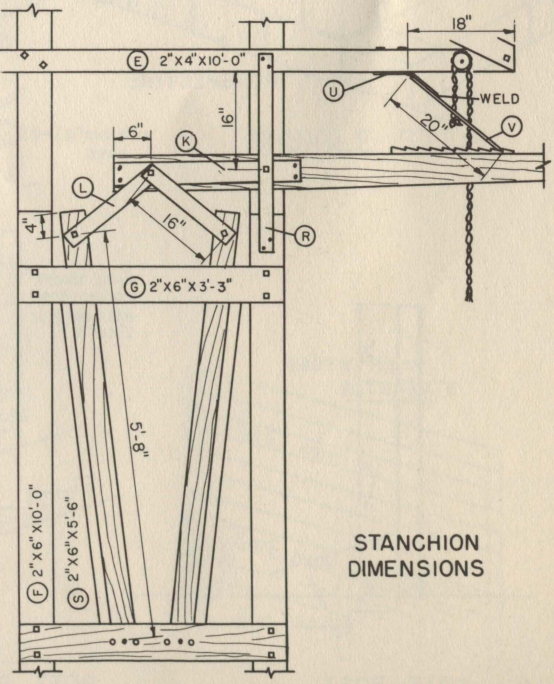
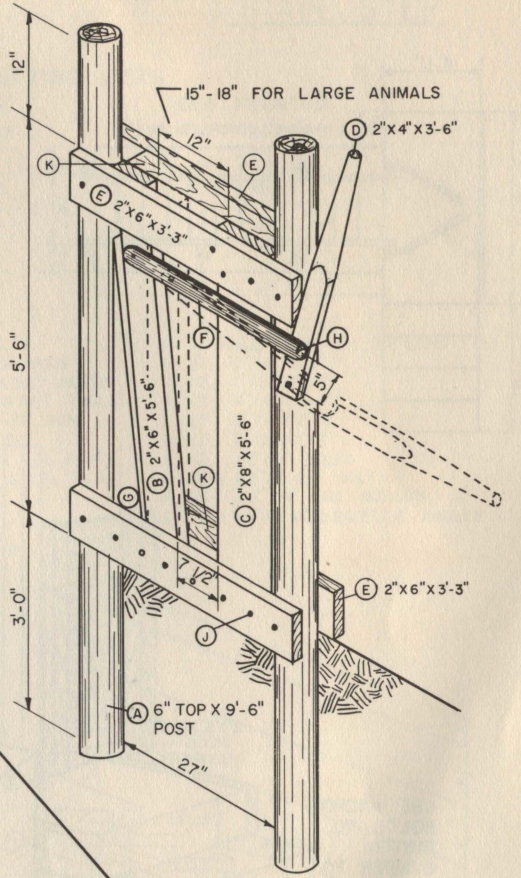
ALL LUMBER PRESSURE-TREATED, EXCEPT ROOF FRAMING.



CUTTING LIST

ITEM NO.	DESCRIPTION
A 2	6" TOP X9'-6" POST
B 1	2"X6"X5'-6"
C 1	2"X8"X5'-6"
D 1	2"X4"X3'-6"
E 4	2"X6"X3'-3"
F 1	1/4"X3"X34" STRAP
G 1	2"X6"X4'-6"
H 2	3/8"X2 1/2" BOLTS
J 12	1/2"X10" BOLTS
K 2	4"X6"X27" FILLER

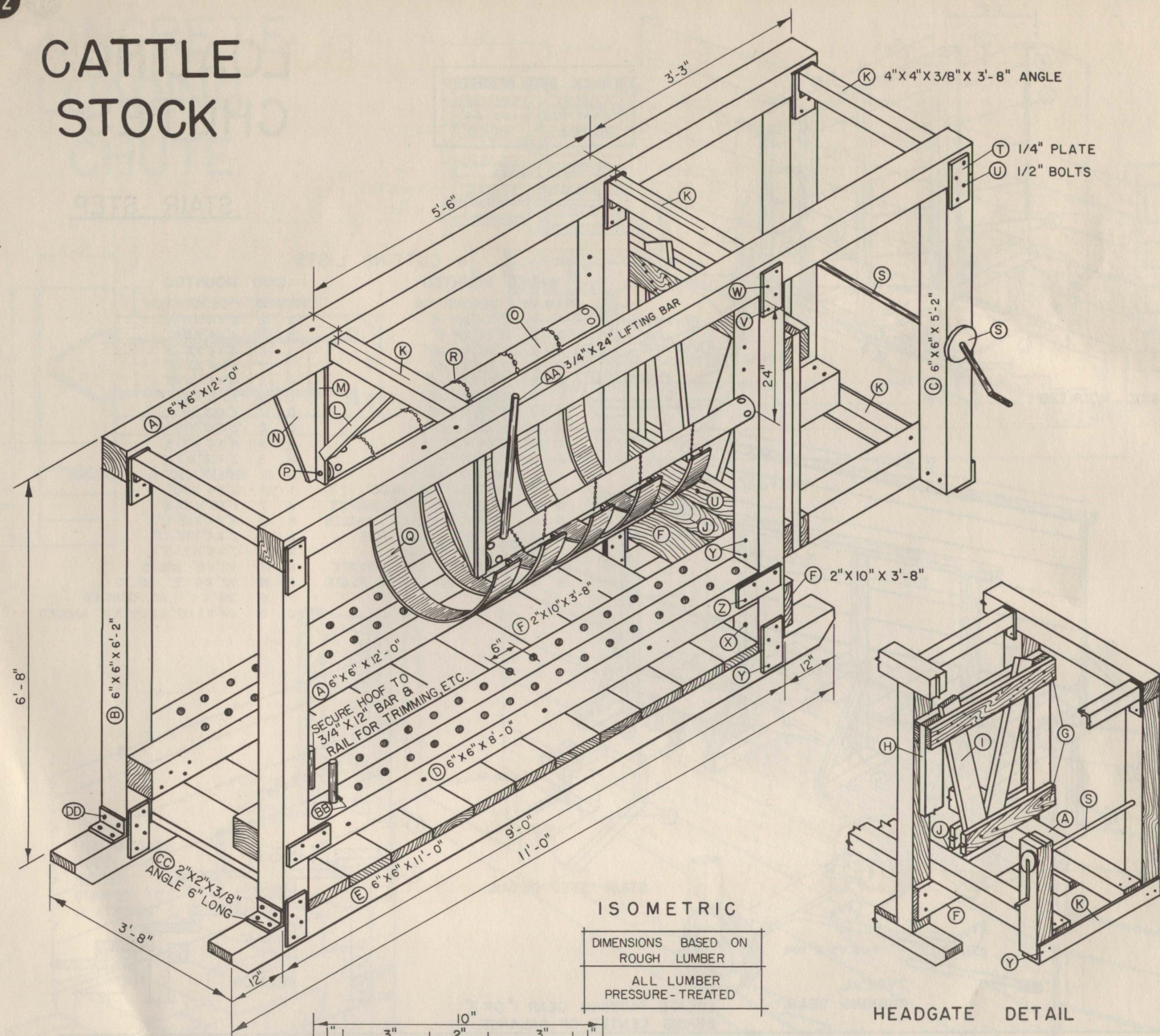
ALL LUMBER PRESSURE-TREATED



STANCHION DIMENSIONS

HEAD GATES

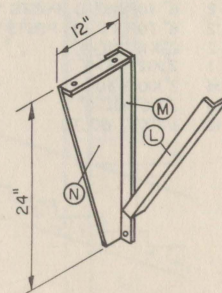
CATTLE STOCK



CUTTING LIST

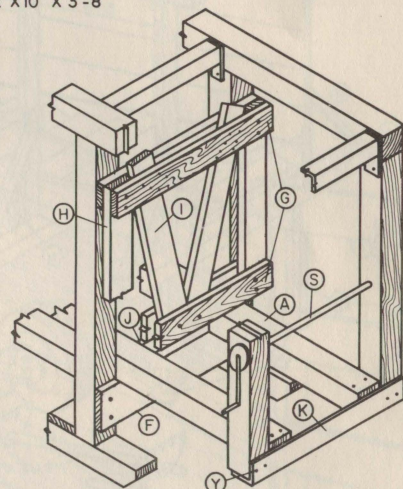
ITEM NO.	DESCRIPTION
A 4	6" X 6" X 12'-0"
B 4	6" X 6" X 6'-2"
C 2	6" X 6" X 5'-2"
D 2	6" X 6" X 8'-0"
E 2	6" X 6" X 11'-0"
F 11	2" X 10" X 3'-8"
G 4	2" X 6" X 3'-8"
H 2	2" X 6" X 4'-0"
I 2	2" X 4" X 4'-3"
J 1	2" X 6" X 20"
K 5	4" X 4" X 3/8" X 3'-8" ANGLE
L 2	2" X 4" X 1/4" X 3'-0" ANGLE
M 4	2" X 2" X 1/4" X 24" ANGLE
N 2	26" X 9" X 1/4" PLATE
O 2	4" DIA. X 5'-0" PIPE
P 2	1 1/2" DIA. X 6'-0" PIPE
Q 5	8" BELT - 3'-0"
R 10	3'-0" CHAIN
S 1	1 1/2" PIPE, CRANK & RATCHET
T 24	1/4" X 5" X 10" STEEL
U 4	1/2" BOLTS - 5 1/2"
V 40	1/2" BOLTS - 6 1/2"
W 12	1/2" BOLTS - 7"
X 4	1/2" BOLTS - 8"
Y 8	1/2" BOLTS - 11"
Z 16	1/2" BOLTS - 12"
AA 4	3/4" X 24" BAR
BB 8	3/4" X 12" BAR
CC 4	2" X 2" X 3/8" X 6" ANGLE
DD 16	3/8" X 4" LAG SCREW

SPLICE PLATE DETAIL

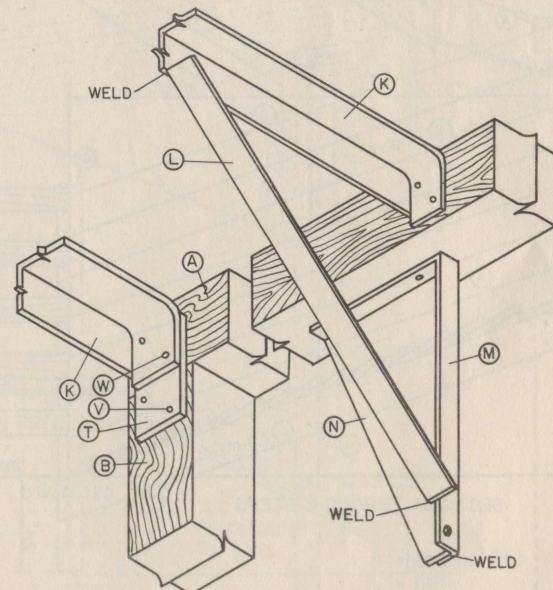


ROLLER HANGER DETAIL

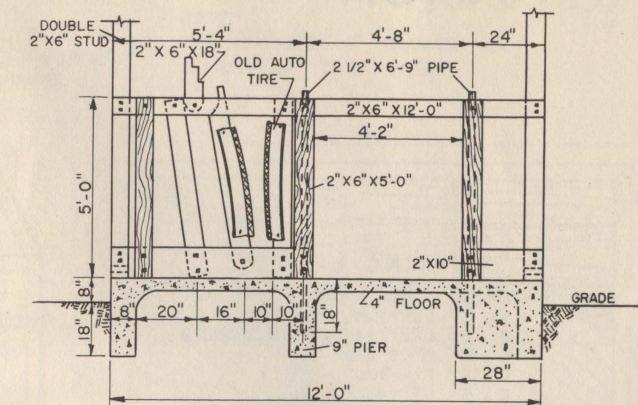
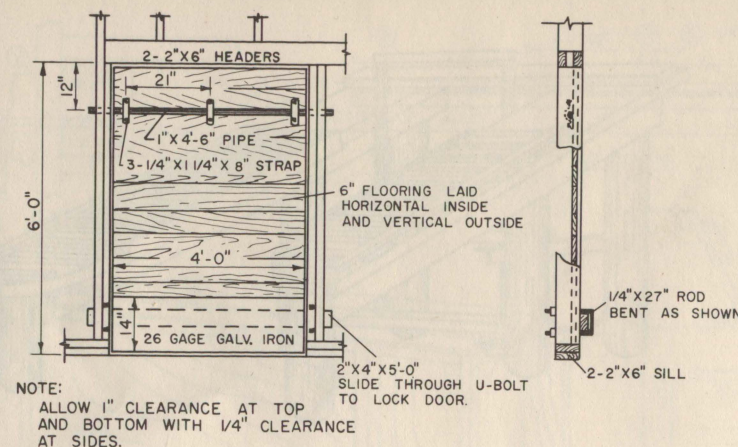
HEADGATE DETAIL



BRACING DETAIL



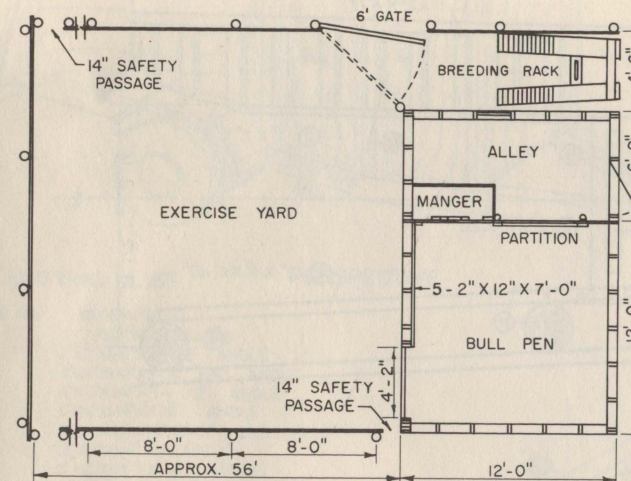
BULL PEN



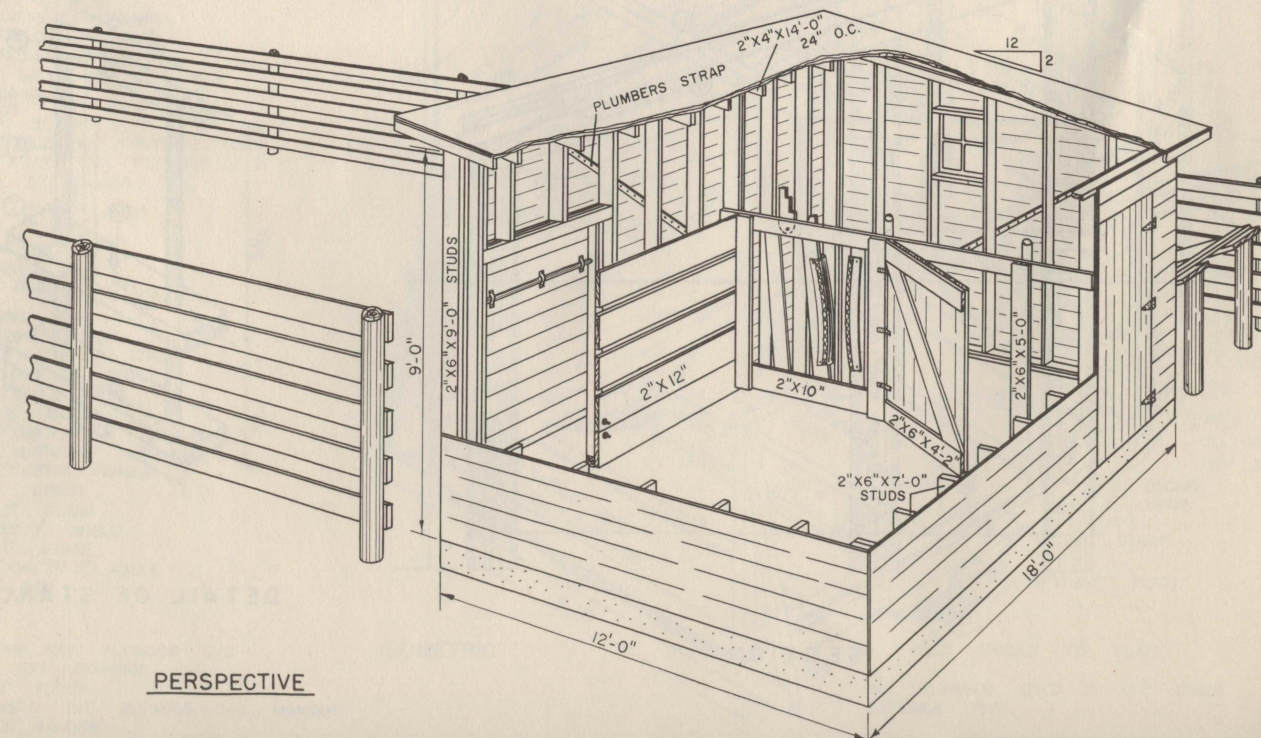
BILL OF MATERIALS

NO.	DESCRIPTION	NO.	DESCRIPTION
FLOOR		SWINGING DOOR	
6 CU. YD.	CONCRETE	16	1" X 6" X 12'-0" FLOORING
ROOF		1	2" X 4" X 6'-0"
12	2" X 4" X 14'-0"	1	1" X 4'-6" PIPE
26	1" X 12" X 10'-0"	INSIDE GATE	
250 SQ. FT.	ROOFING	6	2" X 6" X 10'-0"
WALLS		MAN DOOR	
6	2" X 6" X 14'-0"	2	1" X 4" X 8'-0"
13	2" X 6" X 18'-0"	4	1" X 6" X 12'-0"
2	2" X 6" X 14'-0"	HARDWARE	
2	2" X 6" X 18'-0"	62 FT.	PLUMBERS STRAP
2	2" X 6" X 12'-0"	3	1/4" X 1 1/4" X 8" STRAPS
2	2" X 6" X 18'-0"	30	3/4" X 4'-0" 26 GAGE GALV. IRON
2	2" X 6" X 14'-0"	2	1/4" U-BOLTS
4	2" X 6" X 12'-0"	40	3/8" X 4" BOLTS
70	1" X 6" X 12'-0"	4	1/4" X 2 1/2" BOLTS
12	1" X 6" X 8'-0"	4	1/2" X 5" BOLTS
PARTITION		8	1/2" X 6 1/2" BOLTS
1	2" X 6" X 12'-0"	12	1/2" X 4" BOLTS
7	2" X 6" X 5'-0"	3	MAN DOOR HINGES
2	2 1/2" X 6'-9" PIPE	3	GATE HINGES
1	OLD AUTO TIRE		LATCHES & NAILS AS REQUIRED
1	2" X 10" X 8'-6"		
1	2" X 10" X 4'-6"		

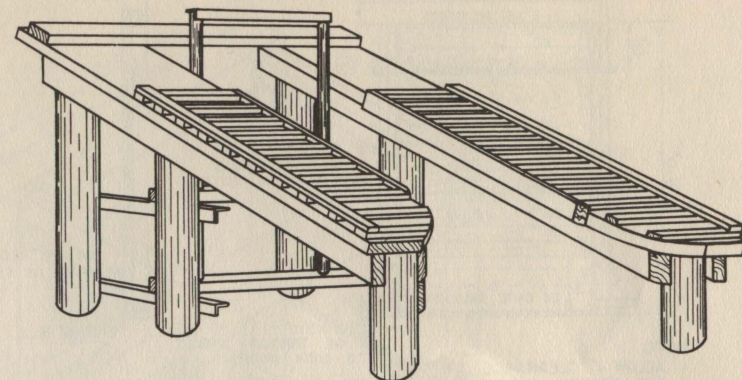
PLAN



PERSPECTIVE



BREEDING RACK

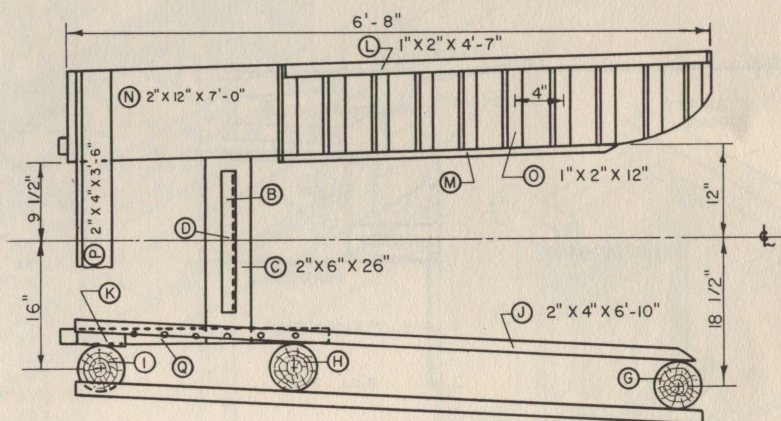


CUTTING LIST

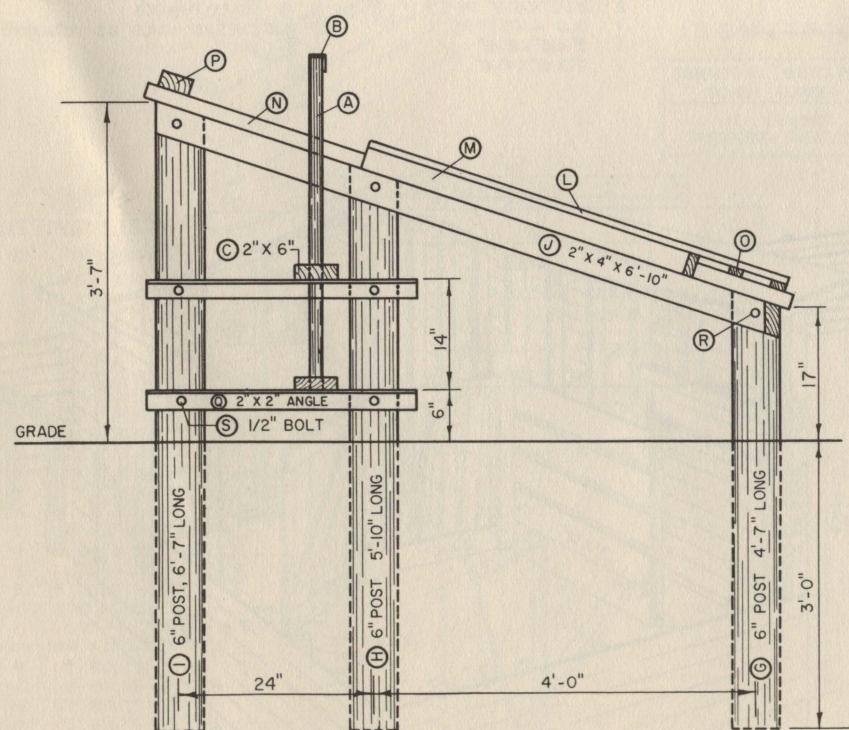
ITEM NO.	DESCRIPTION
A 2	1 1/2" PIPE, 3'-8" LONG
B 1	1 1/2" X 1 1/2" X 3/8" X 18" ANGLE
C 2	2" X 6" X 26"
D 1	EYE BOLT
E 4	1/4" X 6 1/2" BOLT
F 2	1/4" X 2 1/2" BOLT
G 2	6" POST, 4'-7" LONG
H 2	6" POST, 5'-10" LONG
I 2	6" POST, 6'-7" LONG
J 4	2" X 4" X 6'-10"
K 2	2" X 4" X 6" BLOCK
L 2	1" X 2" X 4'-7"
M 2	1" X 3" X 3'-8"
N 2	2" X 12" X 7'-0"
O 20	1" X 2" X 12"
P 1	2" X 4" X 3'-5"
Q 4	2" X 2" X 3/8" X 34" ANGLE
R 6	1/2" X 8 1/2" BOLT
S 8	1/2" X 7 1/2" BOLT
T 4	1/2" X 2 1/2" BOLT

ALL LUMBER PRESSURE-TREATED

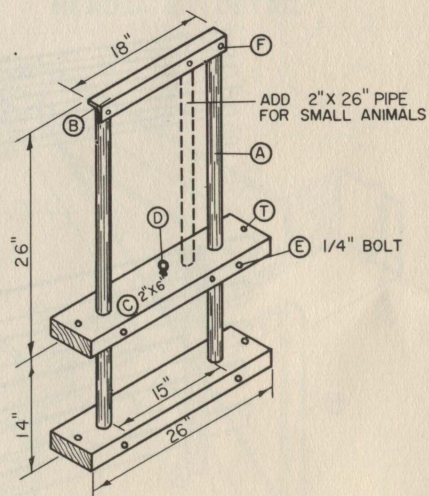
PERSPECTIVE



PLAN

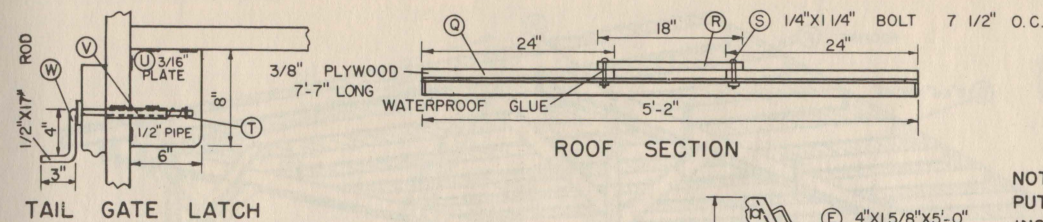


SECTION



DETAIL OF STANCHION

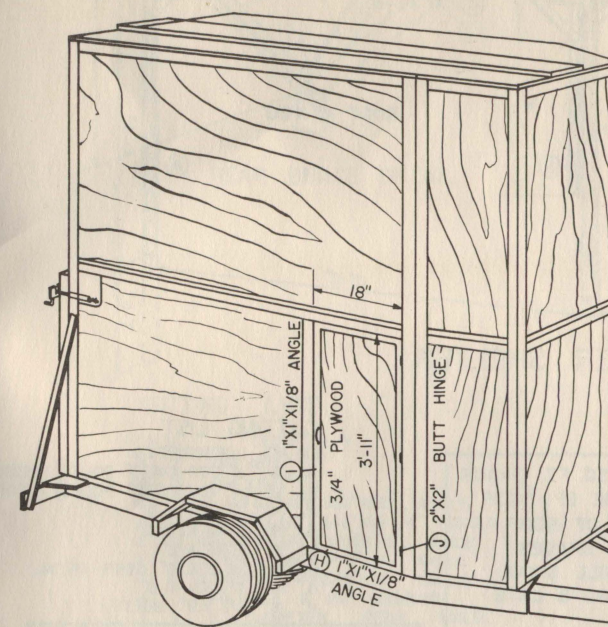
LIVESTOCK TRAILER



ROOF SECTION

TAIL GATE LATCH

NOTE
PUT 5-1"X2"X4'-6" CLEATS ON
INSIDE OF TAIL GATE

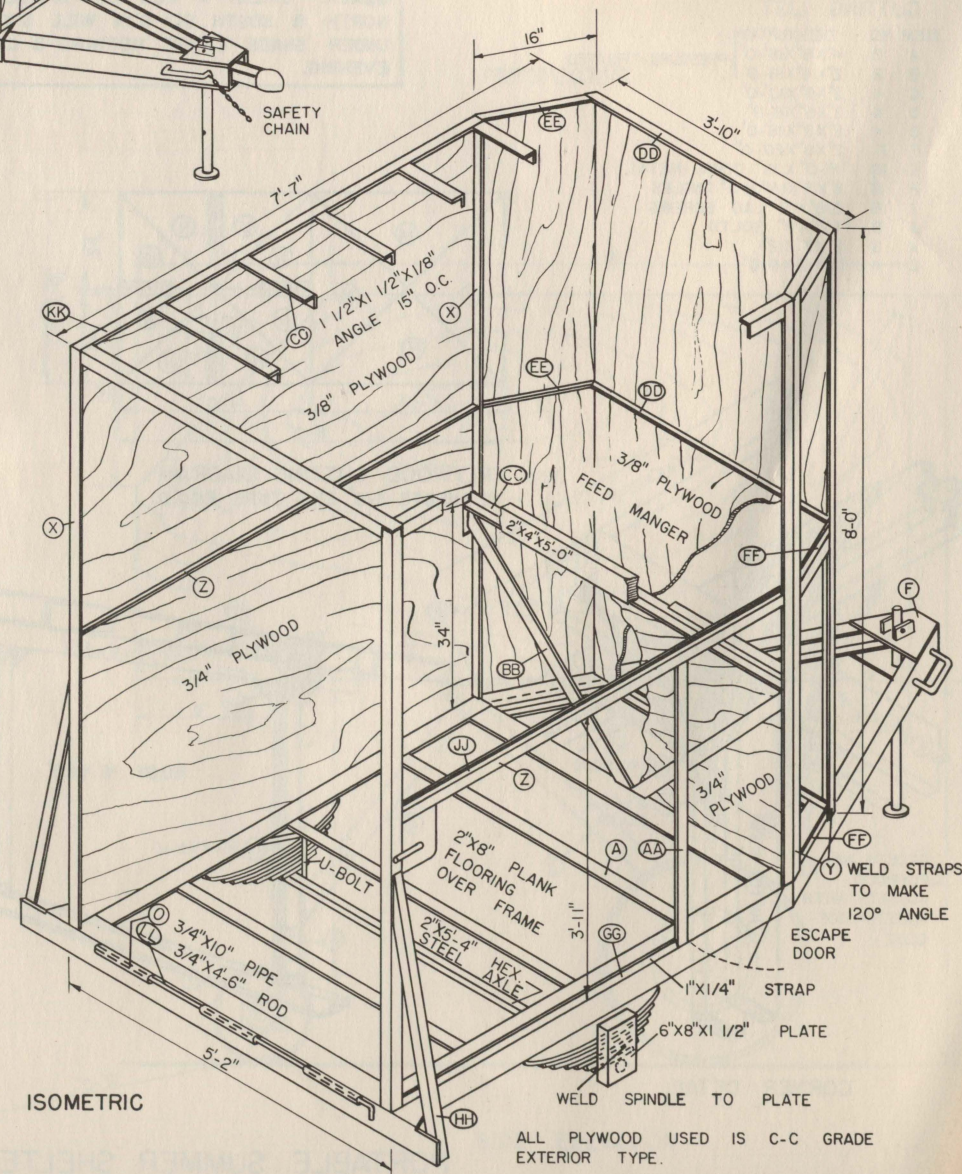


PERSPECTIVE

CUTTING LIST

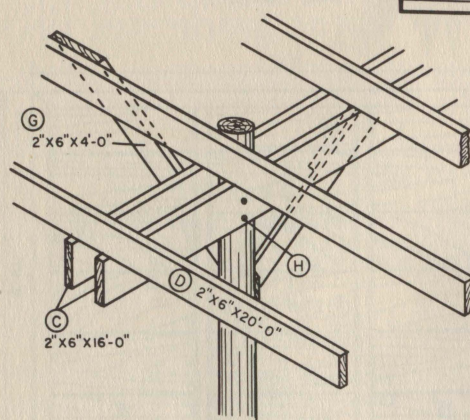
ITEM NO.	DESCRIPTION
FLOOR FRAMING	
A 3	2"X2"X1/4"X5'-1 1/2" ANGLE
B 2	4"X4"X1/4"X7'-10 3/4" ANGLE
C 1	4"X4"X1/4"X5'-1 1/2" ANGLE
D 1	4"X4"X1/4"X6'-8" ANGLE
E 2	4"X1 5/8"X1/4"X5'-0" CHANNEL
F 2	13"X8"X1/4" PLATE
G 1	2"X2"X1/4"X3'-10" ANGLE
ESCAPE DOOR	
H 2	1"X1"X1/4"X8" ANGLE
I 2	1"X1"X1/4"X3'-11" ANGLE
J 3	2"X2" BUTT HINGE
TAIL GATE & LOADING RAMP	
K 2	2"X1/4"X4" STRAP
L 2	2"X5/8"X1/4"X3'-6" CHANNEL
M 2	2"X2"X1/4"X5'-2" ANGLE
N 2	2"X2"X1/4"X3'-10" ANGLE
O 2	3/4"X10" GALV. PIPE
P 6	2"X8"X5'-1 1/2"
ROOF SECTION	
Q 2	24" X 7'-7" X 3/8" EXT. PLYWOOD C-C
R 1	18" X 7'-7" X 3/8" EXT. PLYWOOD C-C
S 32	1/4" X 1/4" STOVE BOLT
TAIL GATE LATCH	
T 1	SPRING
U 1	6"X8"X3/16" PLATE
V 1	1/2"X5" GALV. PIPE
W 1	1/2"X17" ROD
FRAMING	
X 4	2"X2"X1/4"X8'-0" ANGLE
Y 6	1 1/2"X1 1/2"X1/4"X8'-0" STRAP
Z 2	2"X2"X1/4"X6'-4 1/2" ANGLE
AA 1	2"X2"X1/4"X3'-11" ANGLE
BB 2	2"X1/4"X3'-6" STRAP
CC 7	1 1/2"X1 1/2"X1/8"X5'-1 3/4" ANGLE
DD 2	1 1/2"X1 1/2"X1/8"X3'-10" ANGLE
EE 4	1 1/2"X1 1/2"X1/8"X16" ANGLE
FF 4	1"X1/4"X13" STRAP
GG 1	1"X1/4"X4'-5" STRAP
HH 2	2"X2"X1/4"X3'-9" ANGLE
JJ 3	1"X1/4"X6'-1" STRAP
KK 2	1 1/2"X1 1/2"X1/8"X6'-5" ANGLE
LL 1	3/4"X4'-6" ROD
WOOD	
R,Q,R, ABOVE	
3 2/3	3/8"X4"X8" EXT. PLYWOOD C-C
2	3/4"X4"X8" EXT. PLYWOOD C-C
8	2"X8"X7'-6" FLOOR
1	3/4"X32"X5'-0" EXT. PLYWOOD C-C, MANGER
1	2"X4"X5'-0" MANGER

ISOMETRIC

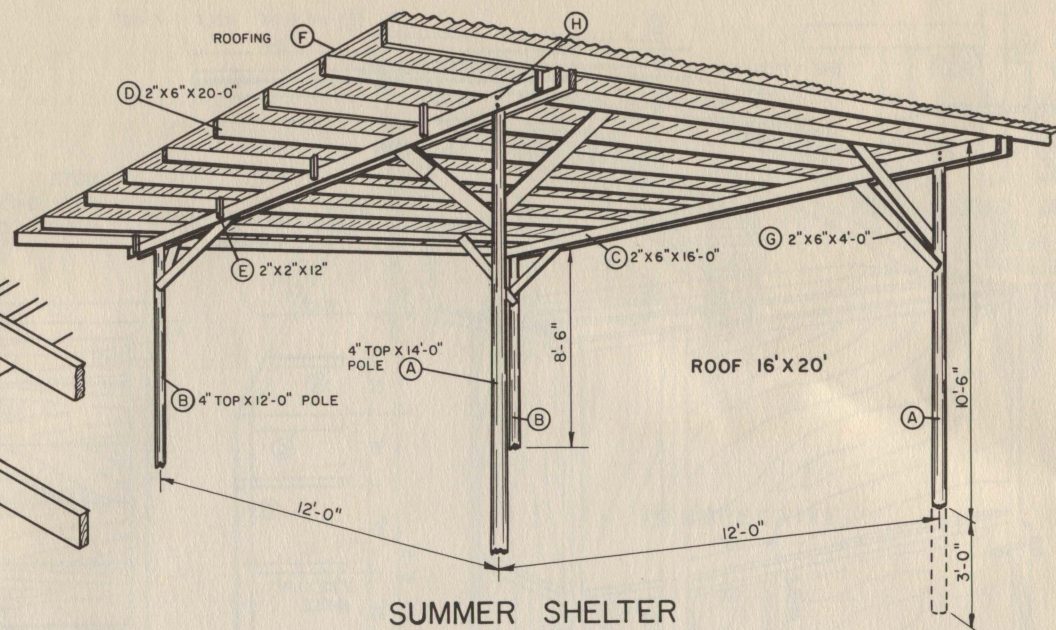


ALL PLYWOOD USED IS C-C GRADE
EXTERIOR TYPE.

SUN SHADES



CORNER DETAIL

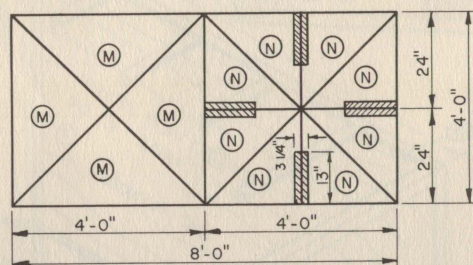


SUMMER SHELTER

NOTES: ALLOW APPROX. 30 SQ. FT. SHADE PER ANIMAL. PAINT TOP SIDE OF ROOF WHITE. PAINT UNDER SIDE OF ROOF BLACK. ORIENT A ROW OF SHADES NORTH & SOUTH SO SUN WILL SHINE UNDER SHADE EARLY MORNING & LATE EVENING.

CUTTING LIST

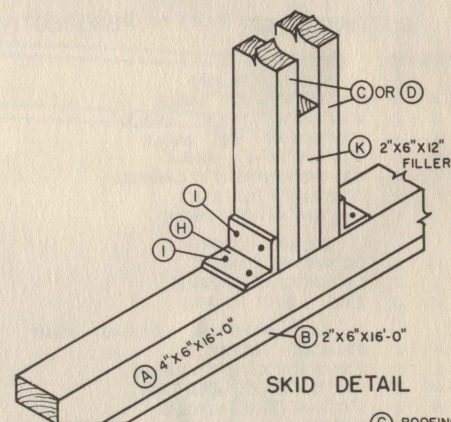
ITEM NO.	DESCRIPTION
A 2	4" X 6" X 16'-0" PRESSURE-TREATED
B 2	2" X 6" X 16'-0"
C 4	2" X 6" X 10'-0"
D 4	2" X 6" X 8'-0"
E 4	2" X 8" X 16'-0"
F 11	2" X 6" X 20'-0"
G 10	16'-0" X 26" CORR. METAL
H 8	3" X 3" X 1/4" X 5" ANGLES
I 16	3/8" X 3" LAG SCREWS
J 8	1/2" X 9" BOLTS
K 8	2" X 6" X 12"
L 4	2" X 6" X 4'-0"



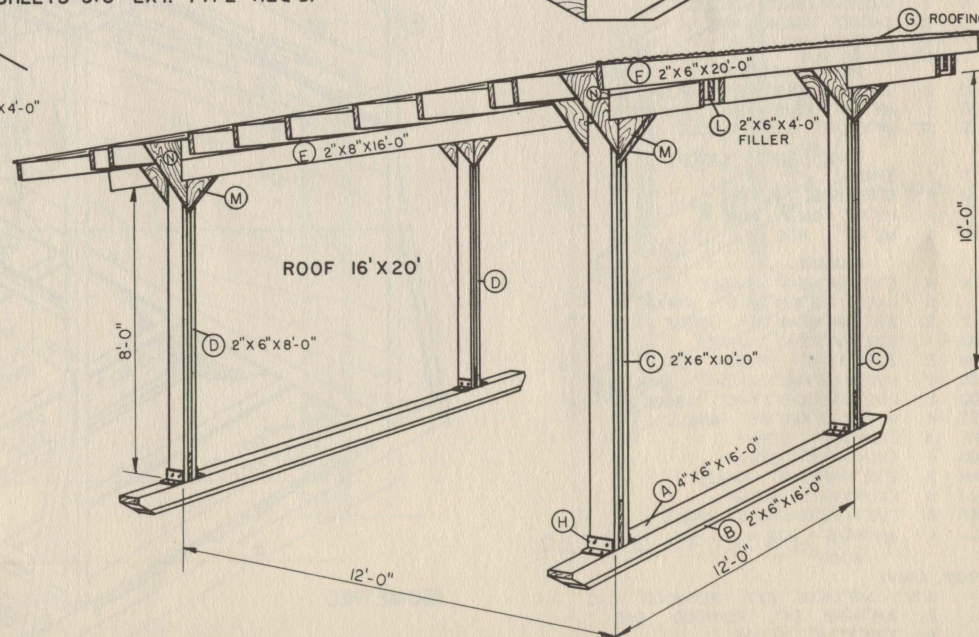
PLYWOOD CUTTING DIAGRAM
2 SHEETS 3/8" EXT. TYPE REQ'D.

CUTTING LIST

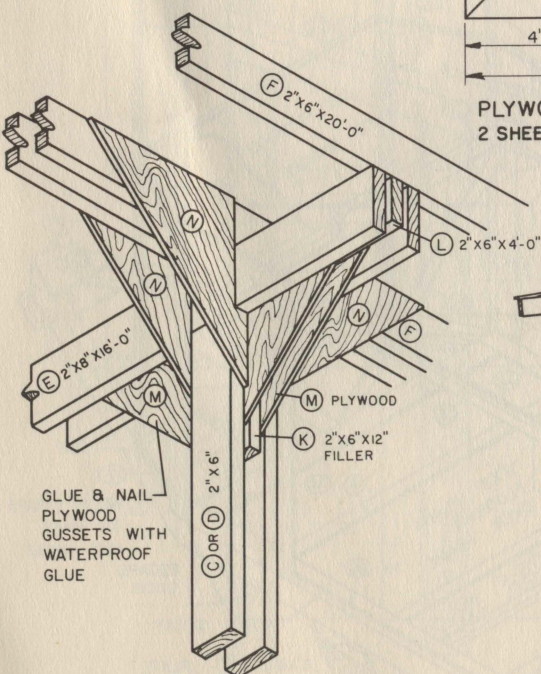
ITEM NO.	DESCRIPTION
A 2	4" TOP X 14'-0" POLES PRESSURE-TREATED
B 2	4" TOP X 12'-0" POLES TREATED
C 4	2" X 6" X 16'-0"
D 9	2" X 6" X 20'-0"
E 10	2" X 2" X 12"
F 10	16'-0" X 26" CORR. METAL
G 10	2" X 6" X 4'-0"
H 8	1/2" X 9" BOLTS



SKID DETAIL

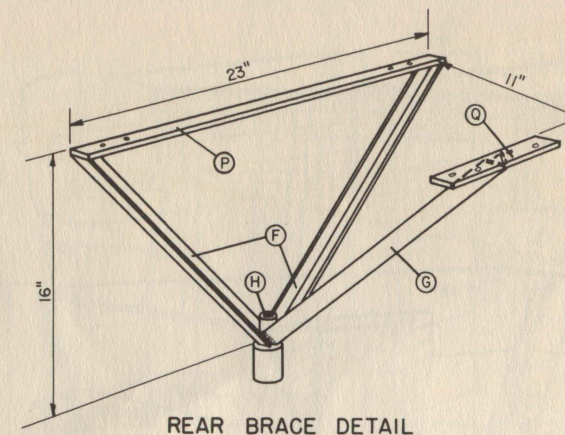


PORTABLE SUMMER SHELTER

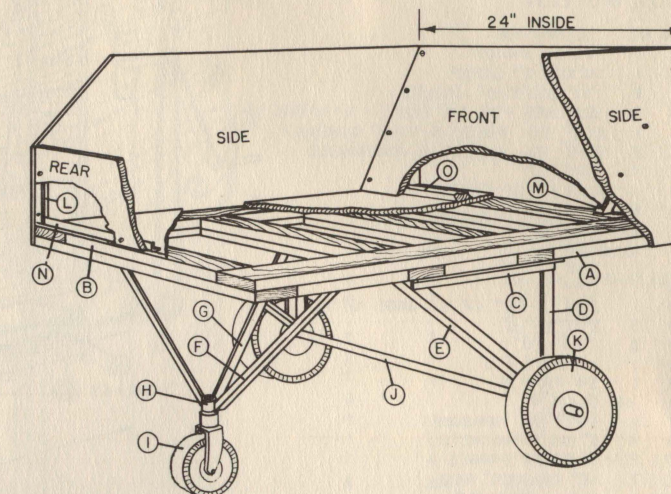


CORNER DETAIL

10 BU. CART SILAGE & FEED



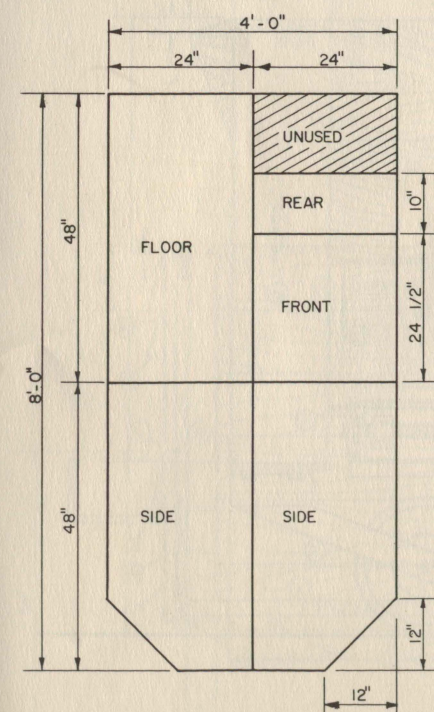
REAR BRACE DETAIL



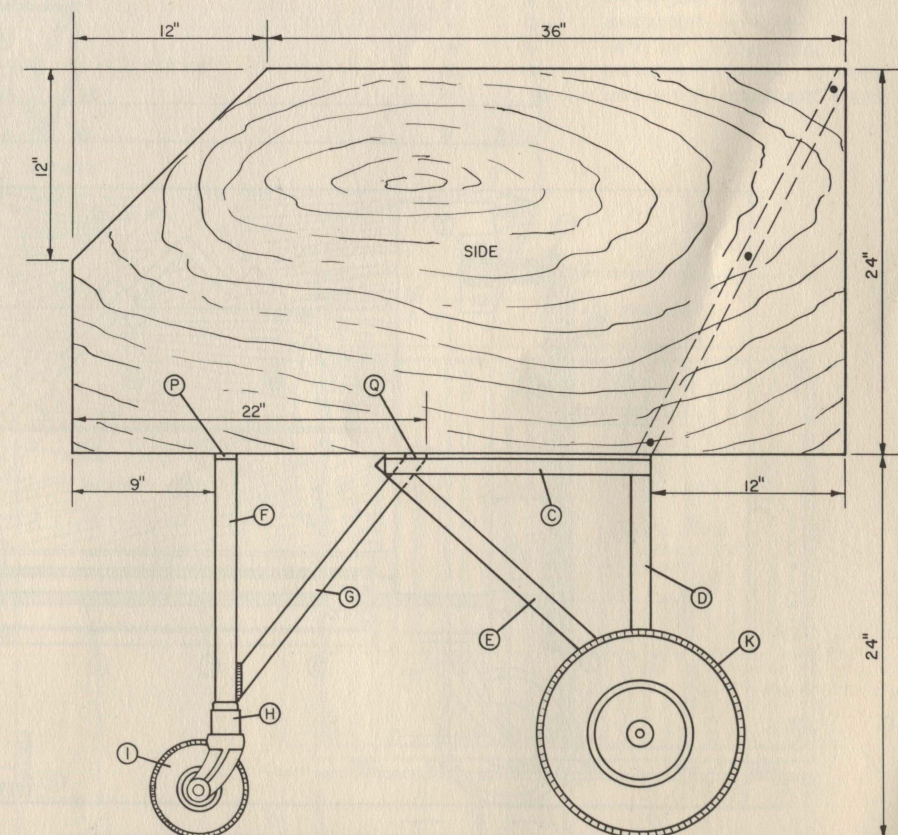
PERSPECTIVE

CUTTING LIST

ITEM NO.	DESCRIPTION
A 2	1" X 4" X 8'-0"
B 4	1" X 4" X 3'-6"
C 2	1 1/4" X 1 1/4" X 3/16" X 18" ANGLE
D 2	1 1/4" X 1 1/4" X 3/16" X 18 1/4" ANGLE
E 2	1 1/4" X 1 1/4" X 3/16" X 24" ANGLE
F 2	1 1/4" X 1 1/4" X 3/16" X 15" ANGLE
G 1	1 1/4" X 1 1/4" X 3/16" X 18" ANGLE
H 1	1" HOLE 2 1/2" BEARING
I 1	6" DIAMETER REAR WHEEL
J 1	3/4" Ø ROD X 2'-6" WHEEL AXLE
K 2	13" DIAMETER FRONT WHEEL
L 2	3/4" X 3/4" X 1/8" X 9 1/2" ANGLE
M 2	3/4" X 3/4" X 1/8" X 23" ANGLE
N 1	3/4" X 3/4" X 1/8" X 24" ANGLE
O 1	1" X 2" X 24"
P 1	1" X 1/4" X 23" STRAP IRON
Q 1	1" X 1/4" X 7" STRAP IRON
1	1/2" X 4'-0" X 8'-0" PLYWOOD (SEE CUTTING DETAIL)



PLYWOOD CUTTING DETAIL



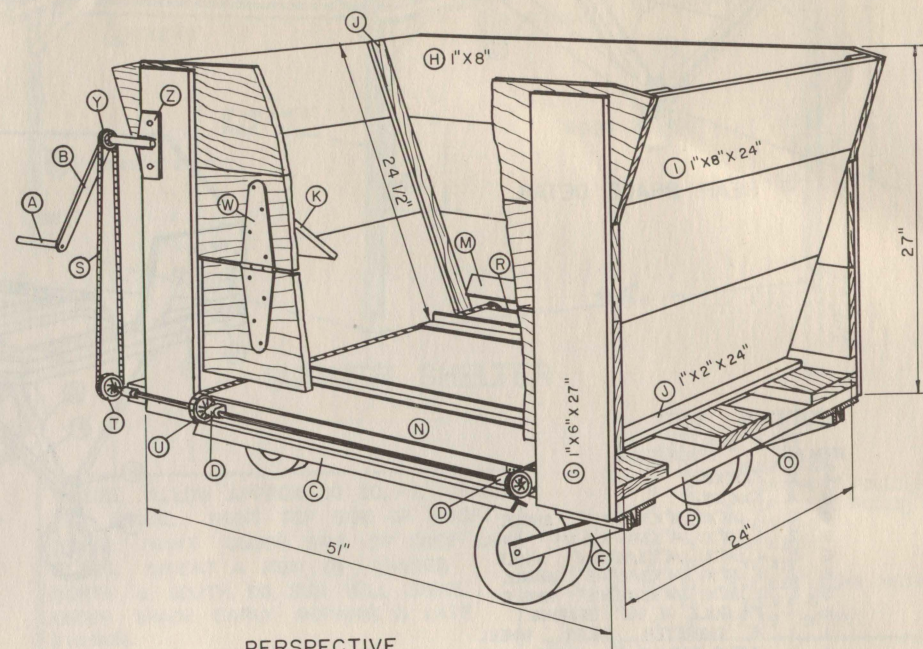
SIDE ELEVATION

13 BU. SILAGE CART

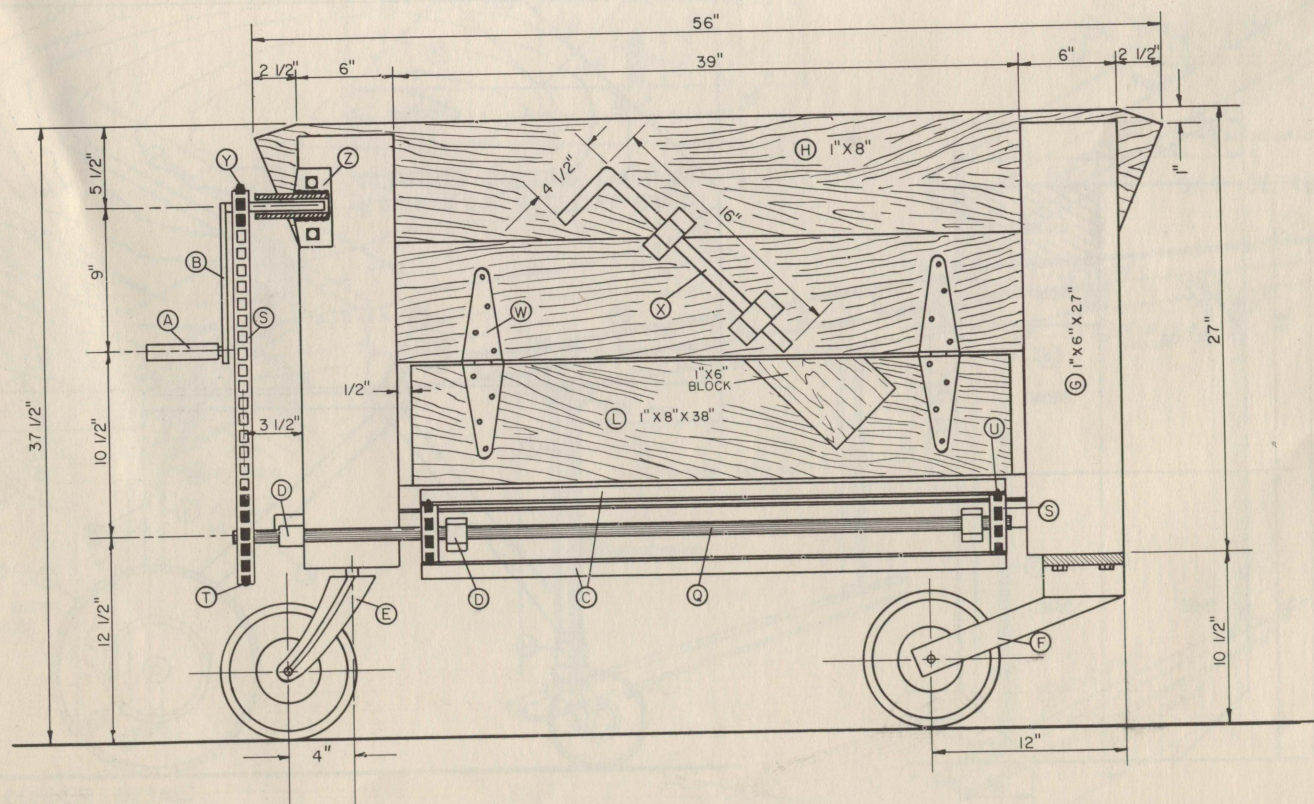
MECHANICAL SIDE DISCHARGE

CUTTING LIST

ITEM NO.	DESCRIPTION
A	1 1/8" DIA. X 4 1/2"
B	1 1/4" X 1" X 10" STRAP
C	6 1" X 1" X 1/16" X 36" ANGLES
D	5 BEARINGS FOR 3/4" ROD
E	1 8 1/2" DIA. WHEEL & PIVOT ASSEMBLY
F	2 8 1/2" DIA. WHEELS & ASSEMBLIES
G	4 1" X 6" X 27"
H	23 LN. FT. OF 1" X 8"
I	6 1" X 8" X 24"
J	6 1" X 2" X 24"
K	1 1" X 6" X 4'-0"
L	1 1" X 8" X 38"
M	1 1" X 4" X 4'-0"
N	1 2' X 4' SHEET OF 26 GAGE METAL
O	3 2' X 6" X 4'-6"
P	2 2' X 6" X 26"
Q	1 3/4" DIA. X 4'-0"
R	1 3/4" DIA. X 36"
S	16' CHAIN
T	1 5 1/2" DIA. SPROCKET
U	4 3" DIA. SPROCKETS
W	2 6" STRAP HINGES
X	1 1/2" DIA. X 20" ROD
Y	1 2" DIA. SPROCKET
Z	1 1/2" X 7" SHAFT & BEARING

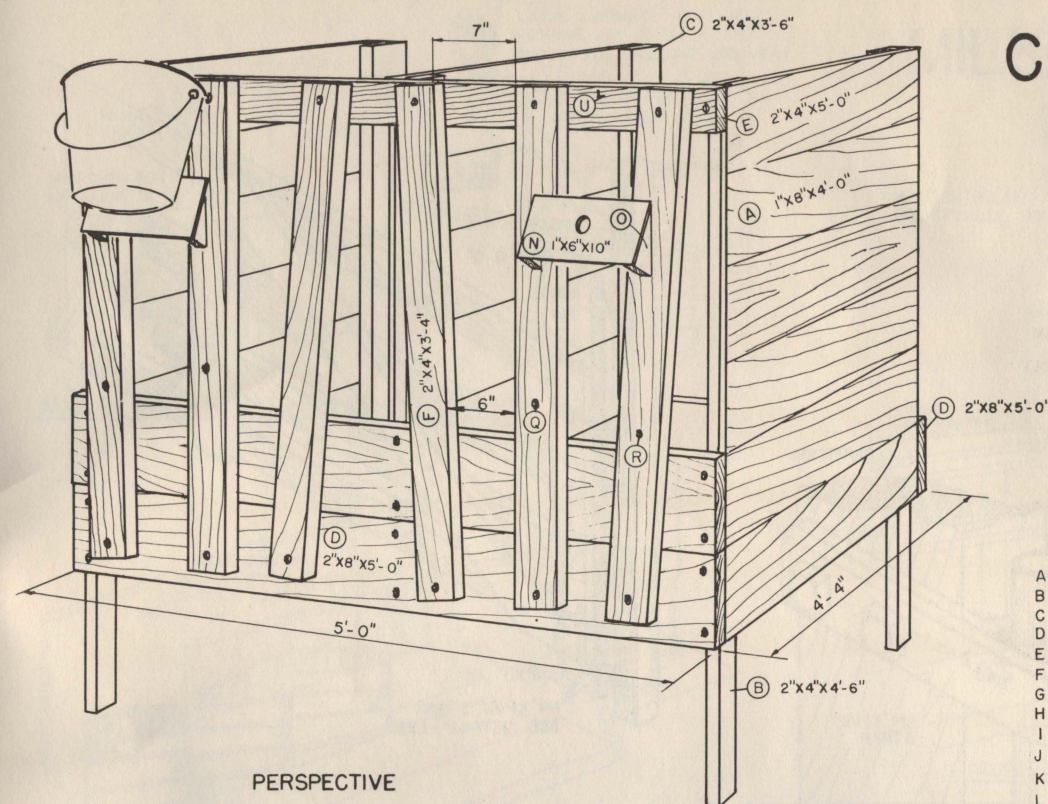


PERSPECTIVE

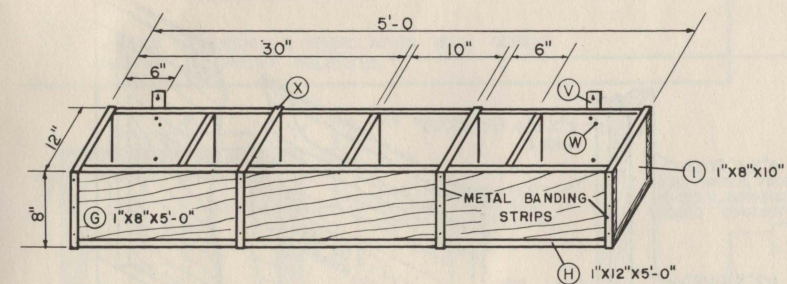


SIDE ELEVATION

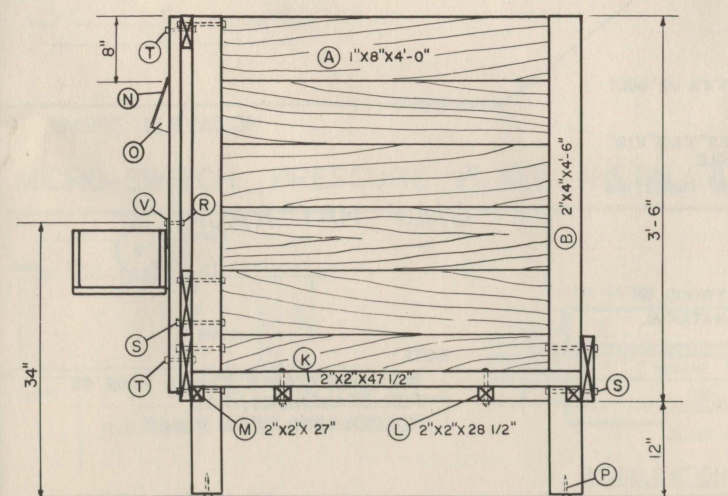
CALF STALL



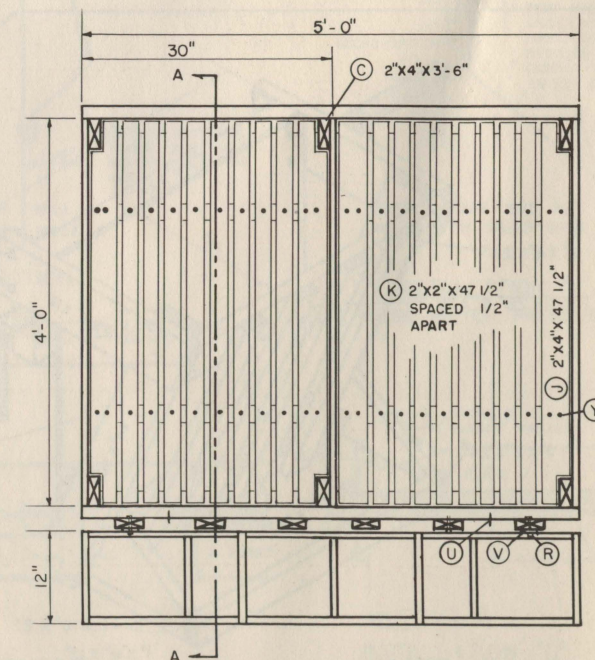
PERSPECTIVE



FEED BOX DETAIL



SECTION A-A

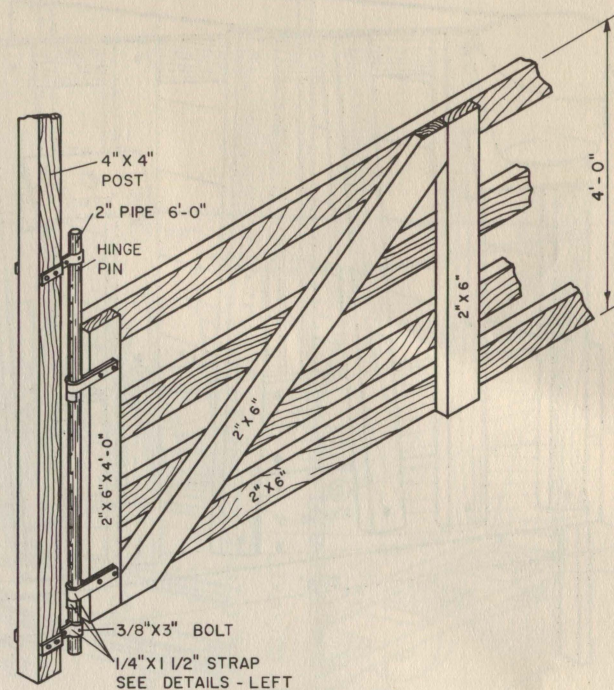
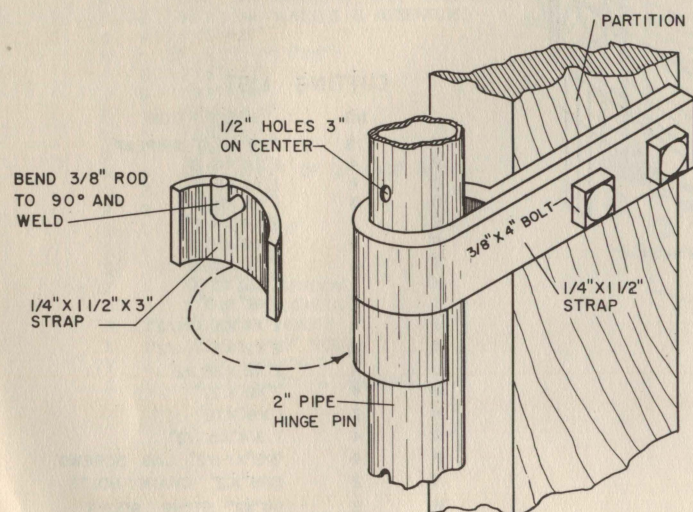
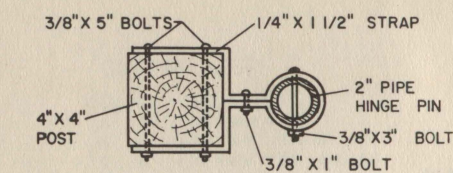


PLAN

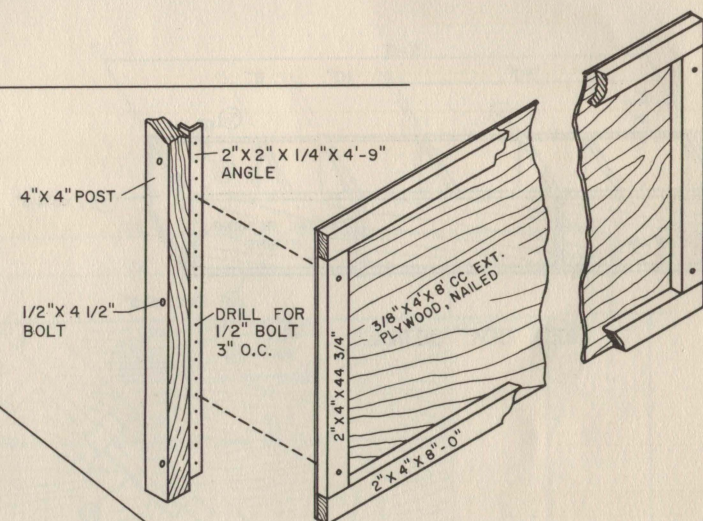
CUTTING LIST

NO.	DESCRIPTION
A	18 1" X 8" X 4'-0" SHIPLAP
B	4 2" X 4" X 4'-6"
C	2 2" X 4" X 3'-6"
D	3 2" X 8" X 5'-0"
E	1 2" X 4" X 5'-0"
F	6 2" X 4" X 3'-4"
G	2 1" X 8" X 5'-0"
H	1 1" X 12" X 5'-0"
I	7 1" X 8" X 10"
J	4 2" X 4" X 3'-11 1/2"
K	16 2" X 2" X 3'-11 1/2"
L	4 2" X 2" X 28 1/2"
M	4 2" X 2" X 27"
N	2 1" X 6" X 10"
O	4 1 3/4" X 5 1/2"
P	4 3/8" X 1 1/2" LAG SCREWS
Q	2 5/16" X 2" CHAIN BOLTS
R	2 1/4" X 2" STOVE BOLTS
S	21 3/8" X 5 1/2" MACHINE BOLTS
T	12 3/8" X 4" MACHINE BOLTS
U	2 1/4" X 3" LAG SCREWS
V	2 3/16" X 2" X 9" STRAPS
W	6 1/4" X 1 1/4" STOVE BOLTS
X	4 5/8" X 3'-6" 22 GA. STRAPS
Y	48 1/4" X 3 1/2" CARRIAGE BOLTS

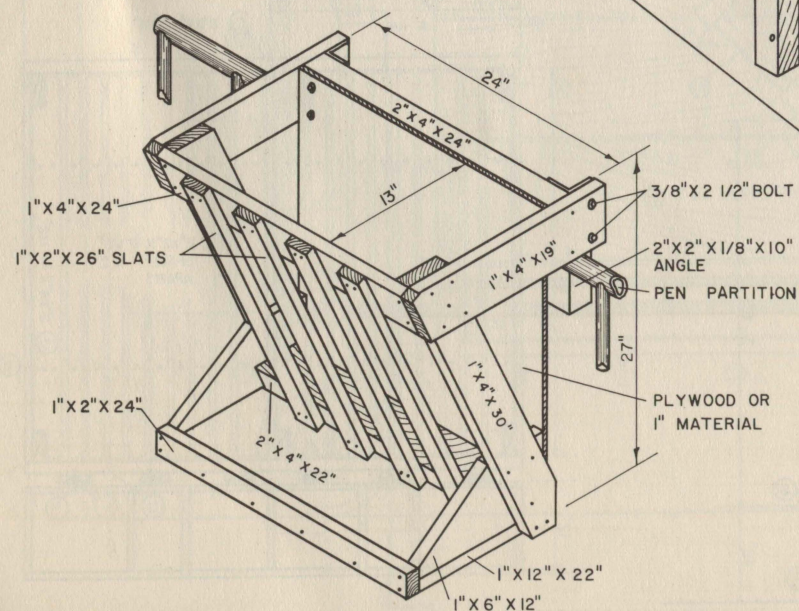
CALF PEN EQUIPMENT



ADJUSTABLE HEIGHT PARTITION



PLYWOOD PARTITION ADJUSTABLE HEIGHT

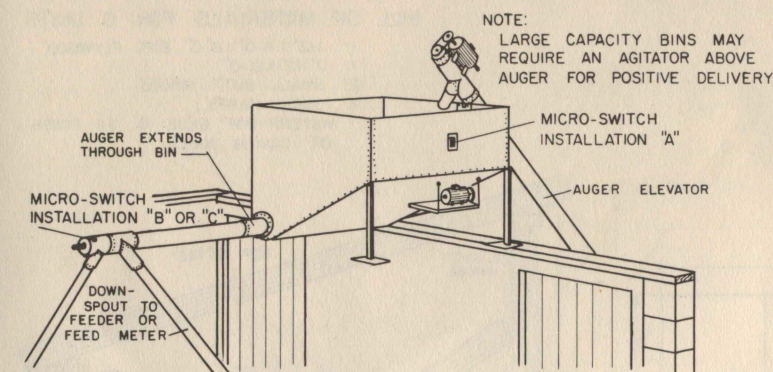


CALF HAY RACK

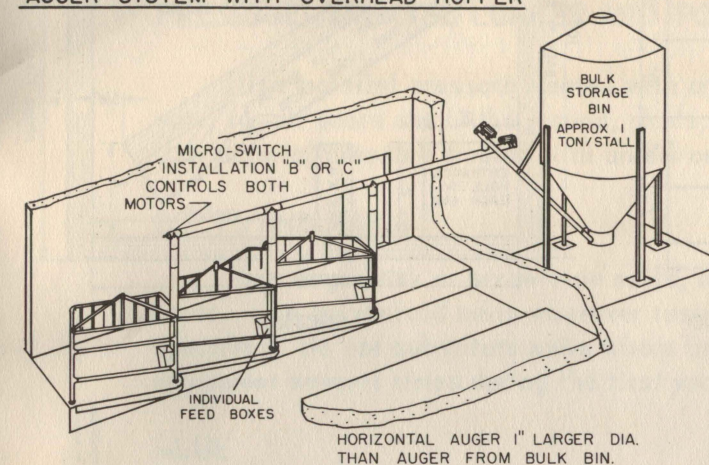
NOTE:
SEE "DAIRY CALF STALL" PAGE 49
FOR STANCHIONS, PAIL
HOLDER AND GRAIN BOXES.

MILKING PLANT FEEDING

TIME CONTROLLED FEED DISTRIBUTOR STARTS AND STOPS
AUTOMATICALLY, KEEPING GRAVITY SPOUTS FILLED.

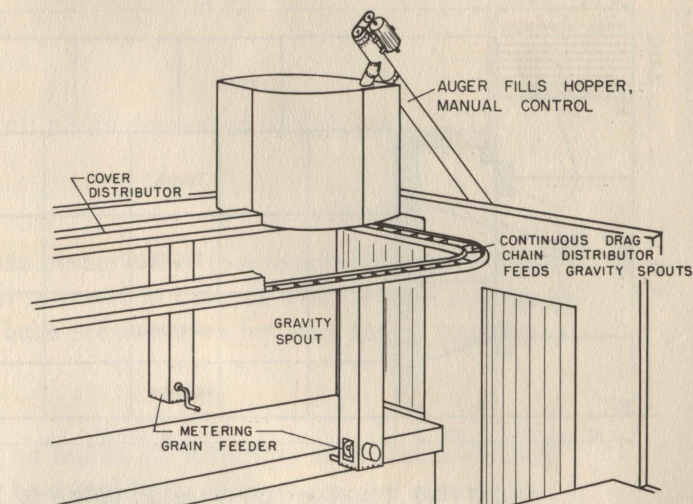


AUGER SYSTEM WITH OVERHEAD HOPPER



AUGER SYSTEM

DETAILS OF DESIGN & INSTALLATION WILL DEPEND
ON THE EQUIPMENT SELECTED.

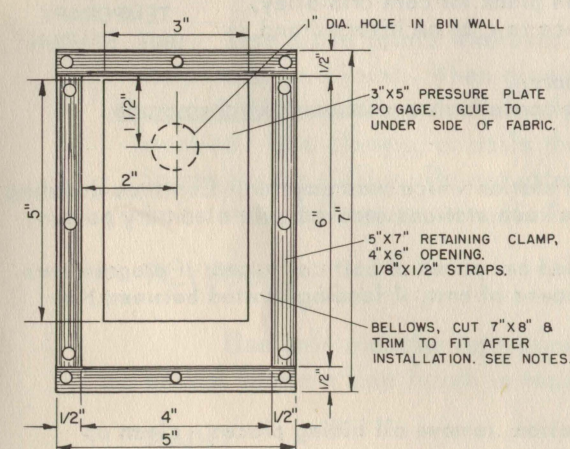


AUGER AND DRAG CHAIN SYSTEM

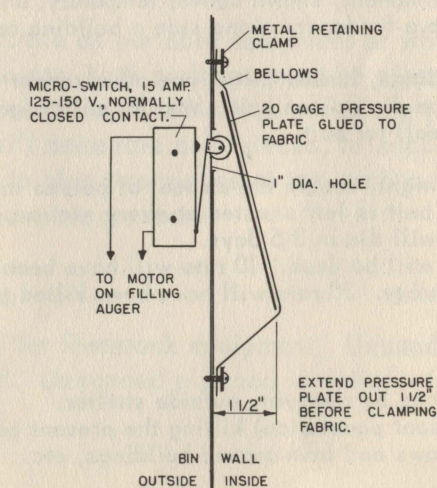
NOTES: 1. OBTAIN MICRO-SWITCH BZ2RW22 OR EQUIVALENT AT ELECTRICAL SPECIALTY SHOP.

2. FOR BELLows USE RAYON OR NYLON FABRIC (FROM LADIESWEAR).

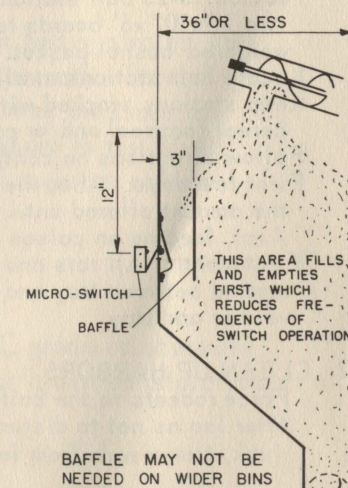
3. USE WEATHERSTRIP ADHESIVE TO GLUE FABRIC TO THE PLATE.



INSIDE ELEVATION

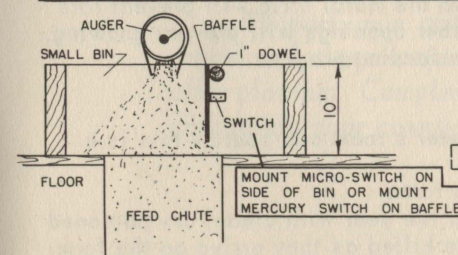
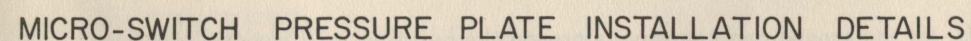


SECTION



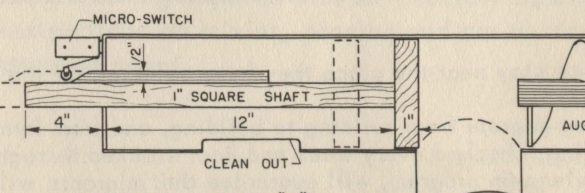
INSTALLATION "A"

USING MICRO-SWITCH PRESSURE PLATE



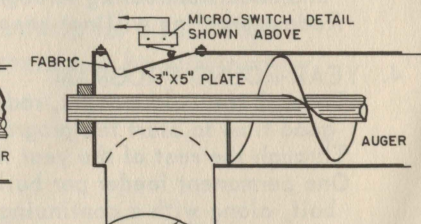
INSTALLATION "D"

BAFFLE & SWITCH OVER FEED CHUTE



INSTALLATION "C"

MANUAL START, AUTOMATIC STOP USING MICRO-SWITCH



INSTALLATION "B"

USING MICRO-SWITCH PRESSURE PLATE

WEIGHTS & MEASURES

Volume = Diameter x 0.7854 x height (for circular bin)
 Volume = length x width x height (for rectangular bin)
 Capacity of grain bin in Bu. is volume in cubic feet x 0.8
 Capacity of corn crib in Bu. is volume in cubic feet x 0.4
 1 bushel = 1 1/4 cubic feet
 1 cubic foot = 0.8 bushels
 1 bushel ear corn = 2 1/2 cubic feet
 1 cubic foot ear corn = 0.4 bushels
 1 board ft. = 1"x12"x12" Nominal Dimensions
 1 gallon water = 8.3 pounds
 1 cubic foot water = 7.5 gallons
 1 gallon water = 231 cubic inches
 1 cubic yard concrete = 81 sq. ft. 4" floor
 1 cubic yard concrete = 54 sq. ft. 6" floor
 0.43 lb. per sq. in. = column of water 1 ft. high
 1 lb. per sq. in. = column of water 2.31 ft. high

Crop	Lbs/Bu.	Lbs/Cu.Ft.	Freshly ground	
			Lbs/Bu.	Lbs/Cu.Ft.
wheat	60	48.0	50	43
barley	48	38.4	37	28
oats	32	25.6	23	18
flax	56	44.8	-	-
rye	56	44.8	48	38
corn (shelled)	56	44.8	48	38
corn (ear)	70	28.0	45	36
soybeans	60	48.0	-	-
grain sorghum	56	44.8	-	-

Hay-Straw	Loose		Baled		Cut	Chopped	
	Ft ³ /ton	Lb/Cu.Ft	Ft ³ /ton	Lb/Cu.Ft		Ft ³ /ton	Lb/Cu.Ft
Alfalfa	450-500	4.4-4	200-330	10-6	1 1/2"	285-360	7-5.5
Non Legume	450-600	4.4-3.3	250-330	8-6	3"	300-400	6.7-5
Straw	670-1000	3-2	400-500	5-4		250-350	8-5.7

SILAGE

Trench or Bunker Silo (tractor packed)

Silage Weight: Corn-35 lbs./cu.ft.; Grass-40 lbs./cu.ft.

Silo Volume: $\frac{\text{top width} + \text{bottom width}}{2} \times \text{height} \times \text{length}$

Upright Silo Capacities, Tons

Depth of Silage Ft.	Tons* of Capacity with an inside diameter of -									
	12'	14'	16'	18'	20'	22'	24'	26'	28'	30'
20	36	50	65							
30	68	92	121	151	186	225	268	314		
40	100	135	177	224	276	332	394	463	538	617
50	133	183	238	302	373	452	538	631	732	840
60	172	234	306	387	478	579	689	808	937	1076
70	213	290	379	480	592	716	852	1001	1162	1332

*Given for Corn Silage or Grass Silage of the same moisture content. As moisture content increases the total tons of silage increase.

Contact power supplier before installing major electrical equipment.

ELECTRIC MOTORS

A gasoline engine can usually be replaced with an electrical motor of 2/3-3/4 as much horsepower. Motors 1/2 hp and over should be on separate 230-volt circuits.

Single-phase motor selection (for 3-phase see power company engineer)

Light starting loads (emery wheel, room fans) -- Split-phase.

Medium starting loads (corn sheller, air compressor, milking machine) -- Capacitor start induction run.

Heavy starting load (hammer mills, large grain elevators, hay hoist, silo unloader) --

Repulsion start induction run; or capacitor start capacitor run.

Enclosure: Open dripproof: protected against falling materials.

Do not expose to rain, snow, or dust.

Splash-proof: protected against splashing except from a very low angle (openings in bottom of case).

Totally enclosed: use where exposed to dust, grit, moisture and falling materials.

Overload protection:

Install motors with built-in overload protection, or provide this protection in the switching mechanism. In addition, circuit fuses (time delay) are required at the service entrance to protect the lines. Check with power supplier.

WIRE SIZES FOR INDIVIDUAL SINGLE-PHASE MOTORS - 2% VOLTAGE DROP, FULL LOAD

Motor Size hp	Full Load Amperage	LENGTH OF RUN, FEET													
		50	75	100	150	200	250	300	400	500	600	700	800	900	1000
115V															
1/4	5.8	12	12	12	10	8	8	6	6	4	4	4	2	2	2
1/3	7.2	12	12	10	10	8	6	6	4	4	4	2	2	2	1
1/2	9.8	12	10	10	8	6	6	4	4	2	2	1	1	0	0
230V															
1/4	2.9	No. 12 Wire Minimum						12	10	10	10	8	8	8	
1/3	3.6	For Appliance						12	10	10	10	8	8	8	6
1/2	4.9	Circuits					12	10	10	8	8	8	6	6	6
3/4	6.9				12	10	10	10	8	8	6	6	4	4	4
1	8				12	10	10	8	8	6	6	4	4	4	4
1 1/2	10			12	10	10	8	8	6	6	4	4	4	2	2
2	12		12	12	10	8	8	6	6	4	4	4	2	2	2
3	17	10	10	10	8	8	6	6	4	4	2	2	2	1	1
5	28	8 ^a	8 ^a	8	6	6	4	4	2	2	1	0	0	00	00
7 1/2	40	8 ^b	8 ^b	6	4	4	2	2	1	0	00	00	000	000	0000
10	50	6 ^a	6 ^a	6 ^a	4	2	2	1	0	00	000	000	0000	0000	250M

a. Type RH or RHW in cable or raceway; all types in air. For other types of wire in cable or raceway use next size larger.

b. For wires in cable or raceway use next size larger. M = thousand circular mils.

Notes:

Amperages from 1956 National Electrical Code.

Length of run based on amperage wire can handle. Insulation:

Rubber types R, RH, RW; Thermoplastic types T, TW.

Conductors in overhead spans must be at least No. 10 for spans up to 50 ft. and No. 8 for longer spans. See 1956 National Electric Code.

If motor is handling variable loads (hammer mill, silo unloader, etc.) wire for next larger size motor, to utilize short-time overload capacity of motor.

HORSEPOWER REQUIREMENTS

FOR ELEVATORS AND CONVEYORS

AUGERS¹ - 56.5 Lbs/Bu Wheat; 6" of Auger Exposed at intake
Elevating Angles: 10°-90°

	10°		20°		30°		40°		50°		60°		90°	
Auger Speed r/p.m.	Bu. per hr.	HP per 10'	Bu. per hr.	HP per 10'	Bu. per hr.	HP per 10'	Bu. per hr.	HP per 10'	Bu. per hr.	HP per 10'	Bu. per hr.	HP per 10'	Bu. per hr.	HP per 10'
4 Inch Diameter*: 4" Tube I. D.; 3 3/8" Auger O.D.; 3 3/8" Pitch														
300	200	.23	190	.23	170	.26	150	.26	130	.26	110	.25	70	.20
400	260	.29	240	.29	220	.34	200	.34	180	.32	150	.32	90	.26
500	330	.34	300	.35	260	.41	240	.41	210	.40	190	.39	110	.32
600	380	.38	330	.42	310	.46	270	.47	230	.47	210	.45	130	.38
700	410	.40	370	.47	330	.51	300	.52	260	.53	230	.52	150	.43
800	430	.42	390	.50	350	.55	320	.58	290	.60	240	.58	170	.48
900	450	.44	400	.52	370	.59	330	.62	300	.66	260	.62	180	.52
1000	470	.45	410	.55	380	.62	340	.68	310	.72	280	.69	190	.58

6 Inch Diameter**: 5 7/8" Tube I. D.; 5 1/8" Auger O. D.; 4 7/8" Pitch

300	730	.50	660	.56	610	.58	520	.60	430	.56	370	.53	230	.44
400	890	.53	820	.67	710	.70	620	.70	540	.69	460	.65	330	.57
500	1000	.56	900	.73	790	.79	690	.80	610	.79	530	.76	390	.67
600	1070	.59	950	.88	850	.86	740	.88	650	.90	580	.87	430	.79
700	1080	.62	970	.83	860	.93	760	.98	660	.98	600	.98	450	.92

*Horsepower single "V" belt drive from motor to auger shaft.

**Horsepower at auger shaft. Add horsepower loss in power train to determine total horsepower required for conveyor.

BUCKET ELEVATOR²

Grain, grass, seed, beans

Approx. Capacity (bu/hr)	Discharge Height (ft)	Motor Size (hp)
100	6-50	1/2
200	6-34	1/2
	35-40	3/4
300	6-24	1/2
	25-50	3/4
350	6-19	1/2
	20-39	3/4
	40-50	1
500	6-24	3/4
	25-44	1
700	6-14	3/4
	15-34	1
	35-39	1 1/2

FLIGHT CONVEYER²

Ear corn, grains and baled hay,
900-1200 bu-hr.
150-225 drive pulley rpm.

Length (ft)	Motor Size Horiz. to 35°-40° Angle (hp)
16-24	1
26-28	1 1/2
30-36	2
38-50	3

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Plans for other equipment items, and for farmhomes and service buildings, are distributed, usually at a nominal charge, by state Agricultural Extension Services. For further information contact your county agricultural extension office or write your Extension Agricultural Engineer.

¹ From "A Study of the Performance of Auger Conveyors", Millier & Rehkgugler, Cornell U., Ithaca, New York.

² From "Selecting Farm Electric Motors, Controls, and Drives," Sou. Assn. of Agr. Engr. & Voc. Agr., Athens, Ga.

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